Crafting Innovations

The evolving institutional regimes of handicraft exporters in emerging economies

Jan Fransen

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JAN FRANSEN



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Source picture in middle: https://www.pinterest.com/memarlaine/what-to-do-with-barbie/
Source picture on the right: ng-Yiwu-China-s-Zhejiang-province-sells-trees-lights-decorations-tinsel-bows.htm

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Ambachtelijk innoveren

De zich ontwikkelende institutionele regimes van exporteurs van handwerk producten in opkomende economieën

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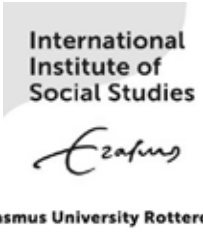

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SUMMARY

Crafting innovations

The evolving institutional regimes of handicraft exporters in emerging economies

Innovation studies mostly focus on cutting-edge innovations, such as the invention of the computer and the Internet. By contrast, incremental innovations have received less academic attention. Incremental innovations are marginal and continuous adjustments to existing products, production processes, organisational structures and/or marketing instruments (Fagerberg, 2005). They play a pivotal role in economic growth and learning in emerging economies and therefore incremental innovations deserve more attention.

The objective of this study is to identify how evolving institutional regimes explain incremental innovation of craft exporters in emerging economies. Institutional regimes are sets of similarly featured rules, and the actors that produce and reproduce them (Crouch, 2005: 23). The handicraft sector is an under-studied innovative growth industry in emerging economies. Innovations range from new product designs to new production processes and the application of new marketing technologies. These innovations are new to the sector, territory and/or firm, but generally not new to the world.

The research is approached as an exploratory multiple case study, studying Yogyakarta (Indonesia), Cape Town (South Africa) and Yiwu (China). To begin with, the study aims to explain incremental innovation by craft exporters in Yogyakarta from the perspective of innovation systems, defined as the systemic interaction of knowledge among firms, government and intermediary organisations (Tödtling *et al*., 2009). The analysis shows that the firms' absorptive capacities mediate the impact of global value chains and local innovation systems on innovation. This case study has resulted in a publication. However, an analysis based on the same theoretical perspective did not yield significant results in the second case study (Cape Town). The case study therefore borrowed the perspective of business systems, defined as the coordination among local, national and international actors influencing the local economy (adapted from Whitley, 1992). The study results show that Cape Town's institutional regime is segmented between formal and informal firms, which significantly explains innovation differences among firms. This case study has also resulted in a publication. The third case study on Yiwu unearthed a highly skewed level of process innovation. Yiwu, also called China's Commodity City, is one of the main international hubs of trade and production of low-priced commodities. In order to explain skewed process innovation, the case study has added the perspective of institutional path dependence, which entails that Yiwu's institutional regime evolves as a consequence of its own history (Martin and Sunley,

2006). The three perspectives (i.e. innovation systems, business systems and institutional path dependence) have been combined into one, for which an exploratory model was developed. Yiwu's case study indicates that path-dependent institutional regimes may cause skewed process innovation. This case study has been submitted for publication. The subsequent comparative analysis applies the same exploratory model.

The study offers four contributions to theory.

Firstly, the study findings show that the institutional regimes are multi-spatial, that is: institutions and actors at international, national and local levels may condition the strategies and competences of craft exporters in emerging economies, which in turn influence their level of product and process innovations. Fuzzy-set and regression analyses show that multi-spatial regimes significantly impact on innovation in the three case studies. The Yiwu case study illustrates that a high dependence on orders and knowledge of global buyers, in combination with a national and local market orientation, may condition local suppliers to strategize process innovations at the cost of product innovation. This is called a 'dependent economy' (Schneider, 2009). By contrast, the Cape Town case study illustrates that a low dependence on orders and knowledge of global buyers, in combination with a coordinated national and local economy, may lead to a bias towards product innovation. This characterises a 'state economy'. This case study also shows that institutional regimes may be segmented: formal firms operate in a significantly different institutional regime, with different levels of innovation. The case study of Yogyakarta stands between the two: its craft exporters strongly depend on orders of global buyers, but combine global, national and local knowledge. Its local economy is coordinated, but local actors are not very strong. This may explain the medium levels of product and process innovation.

Secondly, the study results illustrate that institutional regimes are multilevel, whereby business systems condition innovation systems, which in turn shape firm-level strategies and competences. It shows that higher-order institutions are likely to condition lower-order institutions, but that there is also considerable variety and heterogeneity within institutional regimes. The innovation systems may not fully align with the business system and firms may adopt different strategies within their business and innovation system.

Thirdly, the study illustrates that the institutional regimes of craft exporters in emerging economies evolve over time. It shows anecdotally that irreversible initial institutions, self-reinforcing institutional regimes and sunk costs may steer the direction of development. However, periods of relative stability are likely to be intertwined with periods of path renewal. This is surprising, as innovation systems in mature industries, such as handicrafts, are expected to be path dependent, due to rigid institutions, sunk costs and vested interests. The study explores possible reasons for path renewal.

Finally, the study has illustrated that a multiple case study strategy may enable the exploration of known and unknown factors explaining incremental innovation of

handicrafts exporters across different institutional contexts. Furthermore, the study has applied a fuzzy-set analysis, which is a powerful tool in categorising and comparing institutional configurations. However, the chosen research strategy and methodology also have drawbacks. The main drawback is that the research findings have to be treated with care. First of all, the explanatory model has not yet been adequately tested. The study is limited to three case studies within a diverse and relatively unexplored sector: handicrafts. Second, the case study results cannot easily be compared, because the exploratory model has been developed during the research process. This drawback has partially been overcome by the comparative analysis. Third, the evolutionary analysis is of a descriptive nature due to data limitations. The study therefore strongly recommends more research in order to test the exploratory model.

SAMENVATTING

Ambachtelijk innoveren

De zich ontwikkelende institutionele regimes van exporteurs van handwerk producten in opkomende economieën

Onderzoek naar innovatie is vooral gericht op baanbrekende innovaties, zoals de uitvinding van de computer en het internet. Incrementele innovaties staan daarentegen minder in de wetenschappelijke belangstelling. Incrementele innovaties zijn marginale aanpassingen aan bestaande producten, productieprocessen, organisatiestructuren en/of marketinginstrumenten (Fagerberg, 2005). Ze spelen een centrale rol bij economische groei in opkomende economieën en verdienen daarom meer aandacht.

Het doel van dit onderzoek is om te laten zien hoe ontwikkelende institutionele regimes incrementele innovatie door exporteurs van handwerk producten in opkomende economieën verklaren. Institutionele regimes zijn stelsels van regels met gelijksoortige kenmerken, en de actoren die deze produceren en reproduceren (Crouch, 2005: 23). De ambachtelijke sector is een innovatieve groeisector in opkomende economieën die nog weinig onderzocht is. Innovaties variëren van nieuwe ontwerpen van producten tot nieuwe productieprocessen en de toepassing van nieuwe marketingtechnologieën. Deze innovaties zijn nieuw voor de sector, het gebied en/of bedrijf, maar over het algemeen niet nieuw voor de rest van de wereld.

Het onderzoek is opgezet als exploratieve meervoudige casestudy en uitgevoerd in Yogyakarta (Indonesië), Kaapstad (Zuid-Afrika) en Yiwu (China). Om te beginnen is geprobeerd incrementele innovatie door exporteurs van ambachten in Yogyakarta te verklaren vanuit het perspectief van innovatiesystemen, gedefinieerd als de systemische interactie van kennis tussen bedrijven, overheid en intermediaire organisaties (Tödtling et al., 2009). Uit de resultaten blijkt dat de impact van kennisuitwiseling in wereldwijde waardeketens en lokale innovatiesystemen op innovatie afhangt van het absorptievermogen van de bedrijven. Deze casestudy is gepubliceerd. Toepassing van hetzelfde theoretisch kader leverde echter in de tweede casestudy (Kaapstad) geen significante resultaten op. Daarom is voor deze casestudy het perspectief van bedrijfssystemen gekozen, dat wordt gedefinieerd als de coördinatie tussen lokale, nationale en internationale actoren die van invloed is op de lokale economie (naar Whitley, 1992). Uit de resultaten blijkt dat het institutionele regime in Kaapstad gesegmenteerd is in formele en informele bedrijven, wat een significante verklaring biedt voor innovatieverschillen tussen bedrijven. Deze casestudy is ook gepubliceerd. In de derde casestudy die in Yiwu is uitgevoerd was sprake van een buitenproportioneel niveau van procesinnovatie. Yiwu, dat ook wel de groothandelsstad van China wordt genoemd, is een van de belangrijkste internationale centra voor de handel in en

productie van goedkope producten. Om het hoge niveau van procesinnovatie te verklaren is in deze casestudy het perspectief van institutionele padafhankelijkheid toegevoegd. Volgens dit perspectief ontwikkelt het institutionele regime van Yiwu zich als gevolg van zijn eigen geschiedenis (Martin en Sunley, 2006). De drie perspectieven (innovatiesystemen, bedrijfssystemen en institutionele padafhankelijkheid) zijn vervolgens gecombineerd tot een overkoepelend perspectief waarvoor een exploratief model is ontwikkeld. De casestudy van Yiwu wijst erop dat het institutionele regime padafhankelijk is, wat tot een buitenproportioneel niveau van procesinnovatie kan leiden. Deze casestudy is ingestuurd voor publicatie. In de daaropvolgende vergelijkende analyse wordt hetzelfde exploratieve model toegepast.

Dit onderzoek levert vier bijdragen aan de theorievorming.

Ten eerste blijkt uit het onderzoek dat de institutionele regimes op meerdere geografische niveaus opereren. Dit betekent dat instellingen en actoren op internationaal, nationaal en lokaal niveau de strategieën en competenties van exporteurs van ambachten in opkomende economieën kunnen beinvloeden, wat vervolgens weer van invloed is op hun product- en procesinnovatieniveau. Uit een fuzzy-set- en regressieanalyse blijkt dat multi-spatiële regimes een significant effect hebben op innovatie in de drie casestudy's. De casestudy in Yiwu laat zien dat een sterke afhankelijkheid van orders en kennis van buitenlandse afnemers, in combinatie met een zwakke coördinatie van de nationale en lokale economie, ertoe kan leiden dat lokale producenten zich meer op procesinnovaties dan op productinnovatie richten. Dit wordt een 'afhankelijke economie' genoemd (Schneider, 2009). De casestudy in Kaapstad laat daarentegen zien dat een geringe afhankelijkheid van orders en kennis van buitenlandse afnemers, in combinatie met een sterke coördinatie van de nationale en lokale economie, kan leiden tot een voorkeur voor productinnovatie. Dit kenmerkt een 'staatseconomie'. Uit deze casestudy blijkt ook dat institutionele regimes gesegmenteerd kunnen zijn: formele bedrijven opereren in een significant ander institutioneel regime, met verschillende innovatieniveaus. De casestudy in Yogyakarta zit tussen de andere twee in: exporteurs zijn daar sterk afhankelijk van orders van buitenlandse afnemers, maar combineren wereldwijde, nationale en lokale kennis. De lokale economie is gecoördineerd, maar lokale actoren zijn niet erg sterk. Dit zou het gemiddelde niveau van product- en procesinnovatie kunnen verklaren.

Ten tweede laten de onderzoeksresultaten zien dat institutionele regimes zich op verschillende institutionele niveaus bevinden, waarbij bedrijfssystemen bepalend zijn voor innovatiesystemen, die vervolgens weer van invloed zijn op strategieën en competenties op bedrijfsniveau. Het blijkt dat instellingen van een hogere orde vaak bepalend zijn voor instellingen van een lagere orde, maar dat er ook een aanzienlijke verscheidenheid is binnen institutionele regimes. De innovatiesystemen sluiten mogelijk niet geheel aan bij het bedrijfssysteem en bedrijven kunnen verschillende strategieën kiezen binnen hun bedrijfs- en innovatiesysteem.

Ten derde laat het onderzoek zien dat de institutionele regimes van de exporteurs in opkomende economieën zich in de loop van de tijd geleidelijk ontwikkelen. Het onderzoek levert anekdotisch bewijs dat initiële instellingen, zichzelf versterkende institutionele regimes en 'sunk costs' de richting van de ontwikkeling beïnvloeden. Perioden van relatieve stabiliteit zijn echter waarschijnlijk vervlochten met perioden van padvernieuwing. Dit is verrassend omdat te verwachten is dat innovatiesystemen in volwassen bedrijfstakken, zoals handwerk, padafhankelijk zijn vanwege rigide instituties, 'sunk costs' en gevestigde belangen. In dit onderzoek worden mogelijke redenen voor padvernieuwing verkend.

Ten slotte blijkt uit het onderzoek dat een meervoudige casestudy een geschikte aanpak is voor onderzoek naar bekende en onbekende factoren die incrementele innovatie door exporteurs van ambachten in verschillende institutionele contexten verklaren. Verder is in het onderzoek gebruikgemaakt van een fuzzy-set-analyse, een krachtig middel om institutionele configuraties in te delen en te vergelijken. Er kleven echter ook nadelen aan de gekozen onderzoeksaanpak en methodologie. Het voornaamste nadeel is dat de onderzoeksresultaten met de nodige voorzichtigheid geïnterpreteerd moeten worden. In de eerste plaats is het verklaringsmodel nog niet afdoende getoetst. Het onderzoek is beperkt tot drie casestudy's binnen een gevarieerde en relatief weinig onderzochte sector: handwerk producten. Ten tweede kunnen de resultaten van de casestudy niet gemakkelijk vergeleken worden, omdat het exploratieve model tijdens het onderzoeksproces is ontwikkeld. Dit bezwaar is gedeeltelijk ondervangen door de vergelijkende analyse. Ten derde is de evolutionaire analyse beschrijvend door beperkingen van de data. Het proefschrift besluit daarom met de sterke aanbeveling om verder onderzoek te doen om het exploratieve model te toetsen.

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1 INTRODUCTION

1.1 BACKGROUND

This study aims to understand incremental innovation of craft exporters in emerging economies. Incremental innovations are marginal and continuous adjustments to existing products, production processes, organisational structures and/or marketing instruments (Fagerberg, 2005). They include adjustments to a product design in order to target a new market segment, the introduction of e-marketing and the modification of new production equipment to local conditions. Most of these innovations are not new to the world, but they are new to the sector, territory and/or firm (OECD, 2005). Respondent #38 in Yogyakarta, for instance, reports the following product innovation:

> 'In 1999, I pioneered the production of modern sculptures in Yogyakarta. (…) The designs were made by a friend in the Netherlands. When this became too expensive, I asked the design institute in Yogyakarta, ISI, to design sculptures for me. At the time our profit margins were 100 percent.'

Modern sculptures were not new to the world, but they were a new product for craft exporters in Yogyakarta. The design was an incremental, small change from existing modern sculptures. The same respondent also describes a typical incremental process innovation:

> 'When European import regulations became stricter, I worked with my glue supplier in order to develop a water-based glue.'

The two mentioned innovations have enabled respondent #38 to increase his profit margin and meet the ever-increasing quality standards in export markets. Other innovations may reduce the cost of production or increase the quality of service delivery. Such incremental innovations are far from cutting edge, but enable firms to capture and retain value and/or create flexibility in globally competitive and volatile markets (Best, 1990: 2). Furthermore they contribute to competence building, the flip side of the innovation coin (Lundvall *et al*., 2010). Incremental innovation can therefore be seen as the dynamic engine of economic growth and learning in emerging economies (Lambooy and Boschma, 2001; Lorentzen, 2009; Lundvall *et al*., 2010). These processes may also emanate from low-tech sectors, such as handicrafts (Lundvall *at al*., 2002; Martin and Moodysson, 2011).

The study analyses and compares three case studies in different spatial and institutional contexts. In order to appreciate the contextual differences and their influence on innovation, the study applies an exploratory multi case study strategy (Yin, 2009) and mixed research methods. Such an exploratory approach is rare in international comparative studies, since most studies are quantitative in nature. However, the combination of quantitative and qualitative methods potentially offers a deeper understanding. To begin with, the study aims to explain incremental innovation from the perspective of innovation systems, defined as the systemic interaction of knowledge among firms, government and intermediary organisations (Tödtling *et al*., 2009). The innovation system perspective has greatly contributed to our understanding of innovation and has a considerable impact on innovation studies and policies around the world (Edquist, 2001; Goel, 2004; Lundvall *et al*., 2010). The research concretely tested one aspect of the innovation system perspective in Yogyakarta, Indonesia, which led to a publication. However, when I applied the same theoretical perspective to the second case study (Cape Town, South Africa), it yielded no significant results. I therefore inductively looked for another theoretical angle and applied a business system perspective, defined as the way that actors such as government, intermediary organisations, firms and global buyers coordinate the local economy (based on Hall and Soskice, 2001; Lane, 2008 and Whitley, 1992). This led to a new exploratory model, combining two schools of thought and potentially increasing their explanatory power. It resulted in a second publication. The new exploratory framework was subsequently tested in a third case study (Yiwu, China). The research results were significant, but not all results could be explained adequately. Hence, I added institutional path dependence, which entails that business and innovation systems evolve as a consequence of their own history (Martin and Sunley, 2006), as a third perspective to the exploratory model. The exploratory model has subsequently been fully tested in a comparative analysis, based on an expanded dataset of the three case studies. The next step, which is beyond the scope of this study, would be to test the expanded theoretical framework to other territories and sectors in order to increase its robustness.

Handicrafts are an unusual sector to select in a field of study where most scholars focus on high-tech sectors. Handicrafts are a diverse yet clearly demarcated sector, which includes pottery, masks, sculptures, silverware, baskets, small furniture and statues. It is a relevant sector to select, since incremental innovation is known to be a main driver of growth and learning (UNCTAD, 2010), and the sector is a growth industry in emerging economies. Globally, emerging economies hold a leading position (UNCTAD, 2010). Global buyers include *IKEA*, *Action*, *Zara Homes* and *Anthropologie*. The selected case studies are all urban agglomerations with approximately 1 million people that export crafts in international markets. However, their economies have distinctly different institutional regimes and

innovation outcomes. As a result, the firms take up different positions in international trade. Yiwu is a city in Eastern China, renowned as China Commodity City, the largest wholesale commodity market of the world. The city houses approximately 58,000 Chinese suppliers and 500 offices of global buyers. It is visited by 6,000 buyers annually. Yiwu is known for its low-cost, mass producing counterfeiting industry (Fleming, 2014). Yogyakarta has been famous for Javanese crafts for centuries. Its handicrafts are exported around the globe and increasingly combine contemporary and Javanese designs. By contrast, Cape Town is known as a design capital of African and contemporary crafts. Firms sell small numbers of designed crafts at high prices. Each of these case studies is analysed separately, highlighting its unique features. In addition, a configurational comparative analysis assesses if and how the different institutional regimes of the case studies affect the innovation of firms.

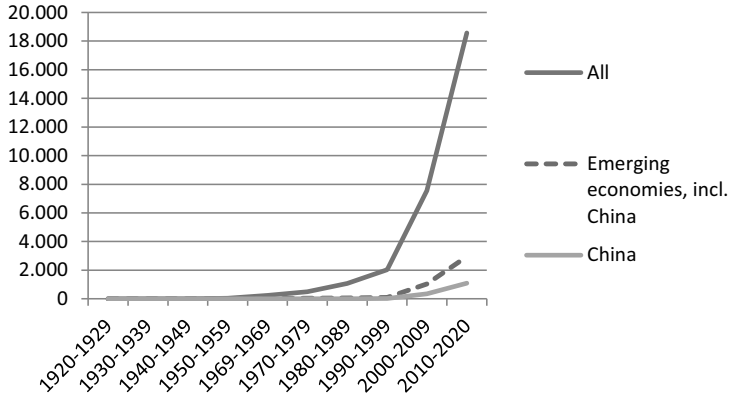
This introductory chapter is structured as follows. Section 1.2 states the problem, after which the research objective and research questions are introduced. Section 1.5 subsequently describes the academic relevance of the study, followed by an introduction of the main concepts and a description of the research setting. The chapter ends with stating its main limitations and the structure of the report.

1.2 PROBLEM STATEMENT

The importance attached to incremental innovation in emerging economies stands in sharp contrast with the relatively modest academic attention that it has received to date. An analysis of three databases (Econlit, ProQuest and Google Scholar) shows that publications on low-tech sectors in emerging economies are underrepresented (table 1.1). In addition, not all academic perspectives receive equal attention.

Studies on innovation systems were rare until Lundvall introduced the concept of a 'national innovation system' in 1987, but the new concept increasingly amassed scholarly attention (figure 1.1; Fagerberg, 2005). Generally speaking, however, about 90 percent of the publications focus on developed economies, and half of the remaining publications focus on China. Most other emerging economies receive relatively modest scholarly attention (figure 1.1). For instance, the ProQuest database reports only 25 articles on innovation systems in Indonesia over the past five years. Google Scholar shows a larger number of academic papers, but these often only refer to Indonesia and its innovation systems in passing.

Figure 1.1 Number of articles on innovation systems



Source: analysis of ProQuest databases, assessed on 21-2-2016.
Note: number of articles for the period 2010-2015 has been doubled to estimate the number for 2010-2019.

Publications are not just skewed spatially, but also sectorally. Over 80 percent of all studies focus on high-tech sectors, including ICT, automobiles and life science (table 1.1; Edquist, 2001; Jensen et al., 2007; Lorentzen, 2009; Lundvall et al., 2010). Of the remaining sectors, agriculture in general and food specifically appear to attract most scholarly attention. Only one article focuses on innovation systems of handicrafts: a study on the effects of cluster support on the innovation of pottery crafters in Morocco (Asstour, 2015). Therefore, I conclude that innovation systems of low-tech sectors in emerging economies, and especially those of handicrafts, are understudied.

Innovation studies are also skewed topic-wise. While institutional factors have drawn a considerable amount of attention, only a few publications consider the evolution of innovation and the ways in which firms absorb knowledge from global and local sources. The ProQuest database includes only 17 publications on knowledge absorption from innovation systems and global value chains (table 1.1).

The above analysis shows that this study delves into a topic that has been relatively understudied. As a result, the study faces a major challenge in contextualising concepts, approaches and methodologies. During the course of the study, it became apparent that contemporary academic literature faces five fundamental challenges in analysing incremental innovation of craft exporters in emerging economies.

Table 1.1 Use of concepts in academic journals (in number of articles and percentage)

Second level search term	First level search term				Average[1]
	Innovation (Econlit)[2]	Innovation system (Econlit)[2]	Innovation system (Google scholar)[3]	Innovation system (ProQuest)[4]	
Emerging economies					
China	213 (5%)	41 (6%)	202 000 (43%)	939 (5%)	5%[5]
India	94 (2%)	20 (3%)	31 900 (7%)	399 (2%)	2%[5]
South Africa	25 (1%)	7 (1%)	32 100 (7%)	130 (1%)	1%[5]
Indonesia	10 (0%)	2 (0%)	19 300 (4%)	25 (0%)	0%[5]
All emerging economies	455 (10%)	94 (14%)	3440000 (73%)	2 061 (10%)	11%[5]
Sectors studied					
High-tech[6]	472 (84%)	86 (82%)	258 000 (78%)	3 129 (81%)	81%
Low-tech[7]	88 (16%)	19 (18%)	71 590 (22%)	711 (19%)	19%
….in emerging economies	11 (2%)	1 (1%)	16 200 (5%)	7 (0%)	
….handicrafts	0 (0%)	0 (0%)	4 190 (2%)	1 (0%)	0%
Observations	*560*	*105*	*329 590*	*3 841*	*334 096*
Concepts studied					
Institutional concepts	1 173(27%)	672(100%)[2]	472000(100%)[2]	20711(100%)[2]	--
Evolutionary concepts	209 (5%)	45 (7%)	126 000 (27%)	1 220 (6%)	6%[5]
Global value chains	23 (0%)	5 (1%)	16 000 (3%)	90 (0%)	1%
Absorptive capacity	60 (1%)	5 (1%)	16 600 (4%)	108 (1%)	1%
Innovation systems	672 (15%)	--	--	--	--
Global value chains, innovation systems and absorptive capacity	1 (0%)	1 (0%)	--[3]	17 (0%)	0%
Observations	*4 360*	*672*	*598 000*	*20 711*	*623 743*
Total observations	4 360	672	472 000	20 711	497 743

Sources: Econlit database and ProQuest search engine, assessed in the period 19 to 21-2-2016.

Notes: [1] Averages are unweighted, as else the Google count would weigh too heavily. [2] Measured as articles published the past 3 years, of which concepts are mentioned in abstract. [3] Measured as articles published the past 3 years, concepts mentioned anywhere in the article [4] Measured as articles published, of which concepts are mentioned in abstract. [5] Excl. the scores from Google Scholar. Google scores are considered unreliable, as they also articles on innovation systems and/*or* the country. [6] High-tech is measured as ICT, computer, software, hardware, automobile, cars, life science, medicines and pharmaceuticals. [7] Low-tech is measured as agriculture, food, textile, garments, furniture and handicrafts.

1) Innovation processes in emerging economies tend to differ from those in developed countries, in that a larger percentage of firms absorb knowledge from global and local sources. The processes of knowledge absorption and the co-relations between global *and* local sources are not yet well understood (Dutrénit, 2007; Giuliani, 2005 and 2011; Humphrey and Schmitz, 2002; Pietrobelli and Rabellotti, 2011). It has also hardly been studied to date (table 1.1).
2) Generally speaking, innovation system studies are focused on radical innovation in the initial stage of the product cycle (Jensen *et al*., 2007; Lundvall *et al*., 2010; Martin and Moodysson, 2011). By contrast, firms in emerging economies generally innovate incrementally and operate in maturing and mature industries.
3) Innovation system perspectives are implicitly focused on product innovations (Lundvall *et al*., 2010), while process innovations greatly contribute to the development and learning in mature industries in emerging economies.
4) International comparison based on the innovation system perspective should take into account that territories have their own, unique economic institutions and evolutions. These institutional factors also influence incremental innovation outcomes (see for instance: Hall and Soskice, 2001; Whitley, 2000).
5) Innovation system studies are likely to take a snapshot of time, implicitly assuming that the innovation system is stable. However, the past decades have illustrated that the innovation systems in emerging economies have been anything but stable. The evolution of innovation is relatively understudied (table 1.1).

1.3 OBJECTIVE

As noted in section 1.1, the study initially aimed to assess the impact of innovation systems on incremental innovation of craft exporters. Then, however, the challenges described above came to the fore. In order to overcome these challenges, the study started delving deeper into the way that institutional regimes and their evolution explain incremental innovation. Institutional regimes are defined as sets of similarly featured rules, and the actors that produce and reproduce them (Crouch, 2005: 23). This resulted in the following research objective:

The objective of the study is to identify how institutional regimes and their evolution explain the incremental innovation of craft exporters in emerging economies.

The concept of institutional regimes is drawn from institutional economics, which aims to understand the economic landscape based on the rules and actors on which an economy depends and through which it is shaped (Martin, 2010). Rules, made and implemented by actors, are expected to create specific innovation incentives and constraints. Institutional regimes comprise those institutions and actors conditioning the behaviour of firms within a specific territory and industry (based on Crough, 2005; Hall and Soskice, 2001; Whitley, 2000). They can range spatially from global to local (Coe et al., 2004; Henderson, 2004; Lane, 2008) and cognitively from higher-order institutions, which set the playing field, to lower-order institutions (Amable, 2000; Rafiqui, 2009; Willliamson, 2000). 'Business systems' (Whitley, 1992) are seen as the highest-order subsystems of the institutional regime, followed by 'innovation systems' and 'firm strategies and competences' (Cohen and Levinthal, 1990; Hall and Soskice, 2001).

The evolution of institutional regimes is analysed from an evolutionary economic perspective, which aims to explain the dynamic processes that jointly influence the behaviour of firms and the market environment in which they operate (Nelson and Winter, 1982). An evolutionary perspective assumes that the past influences the future and, hence, institutional regimes in emerging economies can best be understood by studying their history. Within this wide and multifaceted academic domain, the study focuses on the concept of institutional path dependence, and in particular on how institutional regimes create stability and predictability over time. This approach is relevant, because institutional hysteresis is expected to lead to path dependence in mature industries such as handicrafts. The study also considers the opposite of path dependence, path renewal, which explains why the institutional regime may occasionally change radically. I do not apply the widely used concept of technological path dependence, which analyses how technological choices lock firms into a specific development trajectory, since it is less relevant in mature, low-technology sectors like handicrafts (Martin and Sunley, 2006).

The study is limited to handicraft exporters in emerging economies. Craft exporters operate in buyer-driven global value chains, that is: global buyers control branding, marketing and product design and dominate the activities required to bring a product from its conception to final customers, disposal after use and/or its reuse[1]. Innovation of local firms is likely to be influenced by strategies of global buyers (Gereffi *et al*., 2005). By contrast, supply driven global

[1] Some crafters, especially in Cape Town, use discarded materials in order to develop new crafts. This challenges the linearity assumed by global value chain theory.

value chains are led by large manufacturers (Kaplinsky and Morris, 2000). The specific characteristics and trends of the handicraft sector are introduced in section 1.7. The reasons for selecting the sector and its case studies are described in detail in section 3.2.

1.4 RESEARCH QUESTIONS

The research question guiding the study is as follows: *How do evolving institutional regimes explain innovation of craft exporters in emerging economies?*

The question is split into three sub-questions:

1. *What is the impact of innovation systems on incremental innovation?*
   Innovation systems are part of the institutional regimes impacting on innovation (Edquist, 2001; Lundvall *et al*., 2002). The concept aims to appreciate institutional processes directly underlying changes to products, processes and markets in order to capture value (Marins, 2008). The starting point of this study has been to assess how innovation systems impact on innovation. The following sub-questions are raised: how do local innovation systems and global value chains impact on innovation? How are global and local knowledge combined? What are other sources of information? How do firms absorb knowledge?

2. *How do institutional regimes impact on innovation and how they do co-relate?*
   Since differences in incremental innovation cannot be fully understood based on the innovation system perspective, the study considers the impact of institutional regimes on innovation. Sub-questions are: What are the different layers within an institutional regime? Do different institutional regimes exist? How do institutions co-relate within institutional regimes? How do the different institutional regimes impact on incremental innovation?

3. *How do institutional path-dependence and renewal explain changes in innovation patterns over time?*
   The institutional regimes that explain innovation evolve in path-dependent historical processes. This question studies the unique historical processes within a territory, identifying how the past influences the present and what processes may explain the relatively rapid change in emerging economies. It draws on the perspective of institutional path dependence. Sub-questions are: Are institutional systems path dependent? Do institutional regimes change over time? What may affect changes in institutional regimes and innovation?

1.5 ACADEMIC RELEVANCE

The study aims to contribute to the understanding of incremental innovation in emerging economies by combing three academic perspectives: innovation systems, business systems and institutional path dependence. The academic relevance of the study was slowly revealed during the course of the research (table 1.2).

The research started off with a relatively straightforward research question: What is the impact of innovation systems on incremental innovation in emerging economies? Studies on national innovation systems assume that innovation is a national process (Lundvall, 2007; Lundvall *et al*., 2010), but this assumption does not ring true in emerging economies where relatively little knowledge is available locally and firms therefore depend on knowledge from outside the territory (Chaminade and Vang, 2008). Instead, innovation systems are conceptualised as a combination of local, national and global knowledge networks, including global value chains, local innovation systems, the Internet and communities of practice (Binz *et al*., 2014; Pietrobelli and Rabellotti, 2011). The case study on Yogyakarta confirms that firms do indeed absorb knowledge from these multiple spatial levels. The study highlights how the capacity of firms to absorb knowledge mediates the impact of the various sources of knowledge on innovation. To my knowledge, this mediating role of absorptive capacity has not been studied to date (see academic contribution #2 in table 1.2). The case study thereby contributes to the academic debate on the linkages between multilevel sources of knowledge in emerging economies, and their effect on innovation (Altenburg *et al*., 2008; Asheim and Isaksen, 2002; Belussi and Sedita, 2011; Chaminade and Vang, 2008; Criscuolo and Narula, 2008; Ernst, 2002; Ernst and Kim, 2002; Fu *et al*., 2011; Giuliani, 2005 and 2011; Humphrey and Schmitz, 2002; Lundvall *et al*., 2010; Pietrobelli and Rabbellotti, 2011; Sturgeon *et al*., 2008; Vang and Asheim, 2006).

The second case study, Cape Town, has a distinctly different characteristic: its innovation system is structurally segmented between formal and informal firms. Innovation system theory alone cannot fully explain the segmentation, necessitating a combination with other theoretical perspectives. Specifically, I borrow the concept of a segmented business system from Wood and Frynas (2006), and link the perspective of business systems to that of innovation systems. To my knowledge, a segmented innovation system has not been studied to date and its application is novel within the South African context (academic contribution #3).

The third case study, Yiwu, distinguishes itself by an extraordinarily high level of process innovation and imitation, which innovation system perspectives cannot fully appreciate due to its implicit focus on product innovation (Lundvall *et al*.,

2010; Martin and Moodysson, 2011). The study unravels how the path-dependent evolution of the institutional regime explains the contemporary focus on process innovation (academic contribution #4), and how innovation systems change over time (academic contribution #5). Its approach is novel, because it assesses how global, national and local institutions and actors evolve. The institutional and evolutionary approach was subsequently applied to the comparative analysis of the three case studies (academic contribution #6). To my knowledge, the theoretical framework is novel.

The research applies two innovative research methodologies, in the sense that they are rarely used in innovation studies. The first innovative methodology is a multilevel analysis, whereby data is gathered at the level of the firm, territory, country and international trade networks. Such an approach is highly recommended in innovation studies (Asheim and Isaksen, 2002; Binz *et al.*, 2014; Cooke, 2001; Dicken *et al.*, 2001; Geels, 2004; Glückler, 2007; Humphrey and Schmitz, 2001; Sturgeon *et al.,* 2008). The second innovative research methodology is the fuzzy-set analysis. Fuzzy-set analysis is a relatively recent refinement of qualitative comparative analysis, which is assumed to be superior in comparing complex causality within and between case studies (Rihoux, 2013; Fiss, 2007; Kvist, 2007; Schneider *et al.*, 2010). This methodology is only rarely applied to innovation studies as well.

Table 1.2 Academic relevance

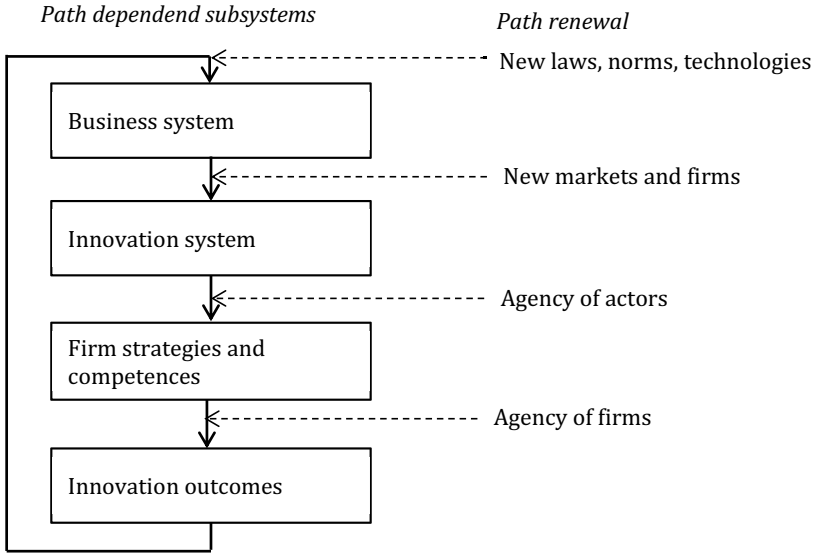
Challenges of innovation system perspectives	Academic contributions	Chapters
Focus on radical innovation in the initial stage of the product cycle	1) Challenges in applying the concept have been identified	2
Functioning of emerging innovation systems not well understood	2) Mediating role of absorptive capacity is proven	4
	3) Segmented innovation systems are analysed	5
Focus on product innovations	4) Difference between product and process innovation is related to innovation systems	6
Stable systems assumed	5) Evolutionary perspective applied to innovation system thinking	5, 6, 7
Problematic international comparison	6) Institutional and evolutionary framework applied across countries	7
	7) Use of multilevel and fuzzy-set analyses	3, 7

1.6 EXPLORATORY FRAMEWORK AND CONCEPTS

The exploratory framework was incrementally developed during the course of the study by combining three perspectives: innovation systems, business systems and institutional path dependence. This section describes the final exploratory framework. It visualises how evolving, multi-spatial and multilevel institutional regimes impact on the firms' incremental innovation. The institutional regime within which craft exporters innovate comprises formal rules (policies, laws and regulations that shape business), informal rules (norms and values) and actors (global buyers, traders, suppliers, communities of practice, governments, business associations, business development organisations; universities and research institutes). The institutional environment and arrangement materialize within multilevel subsystems, whereby high-order subsystems condition lower levels.

The theoretical framework is represented in figure 1.2. The left hand side of the figure depicts the multiple levels of the institutional regime and their impact on innovation. The arrows indicate that higher level institutional subsystems condition the way that lower level institutional subsystems function, creating coherence, predictability and path dependence (Amable, 2000; Crouch, 2005; Rafiqui, 2009). The highest subsystem of the institutional regime is the business system, which describes how international, national and local actors coordinate the local economy. Such coordination may be characterised by relatively weak

Figure 1.2 Theoretical framework



actors, leaving firms open to market forces, by one relatively strong actor (such as a national government or global buyers) who takes a major role in economic coordination, or by the intertwined roles of different local, national and global actors. The business system subsequently conditions the way that the innovation system operates. Within the innovation system, firms exchange, create and diffuse knowledge with other knowledge actors such as universities, communities of practice and global buyers. These knowledge networks may be local, national and/or international. This in turn conditions the firm strategies and competences, leading to specific innovation outcomes. Feedback mechanisms ensure that the institutional regime is reinforced over time.

The right hand side of figure 1.2 depicts that the institutional regime is intrinsically unstable. Market dynamics, shocks, and incremental institutional change may lead to radical changes in the institutional regime, and hence to radical changes in the innovation outcomes of firms. The right hand side may therefore explain why innovation outcomes in a territory would change radically over time.

The remainder of this section introduces the main concepts. A more elaborate description and debate of the theoretical framework is discussed in chapter 2.

1.6.1 BUSINESS SYSTEM

Hall and Soskice (2001) identify two national business systems from the perspective of firms: a liberal and a coordinated market-economy. They analyse in detail why and how the two business systems lead to different innovation outcomes. I adapt their approach to the case studies based on contemporary literature. Firstly, I have opted to analyse business systems from the perspective of coordination between the state, intermediary organisations and firms (Whitley, 1992). From this perspective, many different business systems may co-exist, whereby the two business systems of Hall and Soskice function as two extreme systems (Allen and Alfred, 2009; Griffiths and Zammuto, 2005; Haake, 2002; Nölke and Vliegenthart, 2009; Schneider, 2009; Schneider and Paunescu, 2012; Whitley, 2000; Witt and Redding, 2013; Wood and Frynas, 2006; Wood *et al*., 2011). Secondly, I explicitly include global effects on business systems, because emerging economies are influenced by the international economy to varying degrees (Coe *et al*., 2004; Henderson, 2004; Henderson *et al*., 2002; Lane, 2008). Some emerging economies are highly dependent on decisions made by global buyers and multinationals, and this dependency may greatly impact on local economies, and others much less so (see for instance Schneider, 2009). Thirdly, business systems are becoming increasingly localised, as the specific local institutions affect innovation (Allen and Alfred, 2009; Crouch *et al*., 2009).

Business systems are therefore defined as the coordination among local, national and global actors influencing the local economy. The actors include national and local governments, global buyers, local firms and intermediate actors such as chambers of commerce, business associations and research institutes. I particularly assess their roles through formal rules, such as industrial and innovation policies, and of trust as an informal rule.

1.6.2 INNOVATION SYSTEM

Innovation systems describe the systemic interaction of knowledge among firms and non-firm actors, leading to knowledge generation, diffusion and application (Tödtling *et al*, 2009). They are conditioned by the business system: if the role of non-firm actors in the business system is relatively small, then knowledge interactions are likely to be limited to price incentives in market transactions. By contrast, a greater role of governments and intermediary actors in economic coordination is likely to incentivise systemic knowledge interaction (Hall and Soskice, 2001).

Studies of innovation systems tend to confine themselves to the analysis of a single spatial level, but this ignores the fact that firms often network on different spatial levels. The firms' local, national and international networks enable them to buy raw or intermediate materials, sell final products, and/or to share knowledge. Dicken *et al.* (2001) convincingly argue that understanding the firm's networks demands a multilevel analysis. Such an analysis should include the multilevel institutions and actors that influence innovation. At the international level, quality standards and rules within global value chains condition innovation (Gereffi *et al.*, 2005).

In the relative absence of cutting-edge knowledge in emerging economies, exporting firms tend to acquire knowledge from global value chains (Chaminade and Vang, 2008; OECD, 2005). These are defined as the full range of activities required to bring a product or service from conception to final customers and disposal after use (Kaplinsky and Morris, 2000). Global value chains can enable sustained and systemic innovation of firms in emerging economies, but this process is far from automatic (Lall 2003). It depends on the roles of firms in global value chains, modes of governance and strategies of global buyers (Gereffi *et al*., 2005; Humphrey and Schmitz, 2002; Sturgeon *et al*., 2008). The study specifically analyses the roles of local firms in and governance mechanisms of global value chains, in relation to the local institutional environments and arrangements in which firms operate.

At the national level, innovation policies, regulations and programmes may influence innovation. However, they may to varying degrees apply within a local industry. Local innovation systems enable knowledge exchange and spillovers within a bounded economic space. Actors first search for new knowledge in areas with which they are most familiar and from actors known to be trustworthy (Dosi, 1997). These are likely to be local, since trust and reciprocity are made easier by face-to-face meetings within a shared institutional and organisational context (Boschma, 2005). Monitoring, copying and labour mobility are made easier by physical proximity as well (Asheim *et al*., 2009; Asheim and Isaksen, 2002). Over the past decades, a growing number of local innovation systems at varying stages of advancement have surfaced within emerging economies (OECD, 2005; Chaminade and Vang, 2008). In these emerging local innovation systems, local knowledge exchange starts playing a more prominent role (Chaminade and Vang, 2008). It enables firms to combine global and local knowledge, which may lead to innovations (Criscuolo and Narula, 2008). At the same time, it enables knowledge diffusion from firms operating within global value chains to other local firms (Chaminade and Vang, 2008).

Firms also acquire knowledge from other sources, such as the Internet, TV, periodicals and communities of practice (Belussi and Sedita, 2011). The innovation system therefore comprises these varied global, national and local knowledge interactions, actors and institutions, creating multilevel innovation systems.

1.6.3 Firm strategies and competences

Firms are the core actors in the innovation game. The multi-spatial business and innovation systems within which firms operate condition their strategies and competences. If, at the one extreme, the global and local actors strongly coordinate and share knowledge, firms are likely to share knowledge reciprocally enabling incremental innovation (Hall and Soskice, 2001). If, at the other extreme, economic coordination and knowledge sharing is left to market mechanisms, then firms cannot easily share innovation risks. Since each firm innovates more or less in isolation, they are more likely to develop 'out-of-the-box', radical innovations, instead of incremental 'add-ons' (Hall and Soskice, 2001; Nölke and Vliegenthart, 2009).

Within the opportunities and constraints of the institutional regime, firms adopt strategies and build up competences. Firm strategies that impact on innovation are the product-market combination within which a firm operates: high level product-market combinations are more likely to demand innovations than low-level combinations (Kaplinsky and Morris, 2001). Within this context, firms adopt their

innovation strategy: they may opt to imitate products and processes, reduce costs through process innovation, focus on product development, pioneer new products and/or processes, or combine strategies (Lundvall *et al*., 2002).

The ability of firms to innovate depends on their competences. Firms especially require *absorptive capacity* in order to acquire existing knowledge, assimilate it, combine it with prior knowledge and realise innovations (Zahra and George, 2002). A higher level of competence enables innovation. Competences may also be skewed towards product or process innovation. This may in part explain the firms' type of innovation (Dutrénit, 2004 and 2007).

1.6.4 PATH DEPENDENCE AND RENEWAL

Institutional regimes are expected to be path dependent most of the time, which entails that their outcomes evolve as a consequence of their own history (Martin and Sunley, 2006). Initial institutions, in particular norms and values formed long ago, may limit the development trajectories of a sector within a territory. The institutions within an institutional regime are furthermore likely to reinforce other change over time, especially when positive feedback mechanisms create increased returns (Dosi *et al*., 2005; Rafiqui, 2009; Whitley, 1992). Sunk costs and institutional hysteresis in mature industries may also lead to institutional inertia (Boschma and Frenken, 2006; Essletzbichler and Rigby, 2007).

However, the incremental accumulation of market dynamics, shocks and minor institutional change may over time lead to radical shifts of the institutional regime, and hence to radical changes in innovation outcomes (Boschma and Frenken, 2007; Crouch, 2005; Martin and Sunley, 2006). Radical change, called path renewal, has increasingly dominated the study of institutions (Morgan, 2016). Policy reform or collective action may purposefully change institutions, while the uncoordinated action of actors and evolution of informal institutions may lead to unintended changes (Hall and Thelen, 2009; Kingston and Cabellero, 2009.). New technologies may furthermore create a powerful urge for institutional change, as for instance the introduction of computers has changed business systems all over the world (Williamson, 1995). These changes may fundamentally alter the business system and may in turn alter the innovation system. Other, less fundamental changes include local firms entering new markets, which brings in a new institutions and actors, and new firms bringing in new ideas and knowledge (Martin and Sunley, 2006; MacKinnon, 2008). These changes are less likely to directly affect the business system, but they may change the innovation system within which firms operate. At a lower, more concrete level, actors within the

innovation system may show agency[2] and opt to change their roles (Mackinnon, 2008; Rafiqui, 2009). For instance, a business association may take up the role of linking firms to universities. Finally, firms may also show agency by deviating from the rules of the game and innovate differently (Crough, 2009; Hall and Thelen, 2009). Such changes at 'lower' institutional subsystems indirectly impact on the business system through feedback loops, and may incrementally lead to path renewal.

1.6.5 Innovation outcomes

The study aims to explain the incremental innovation outcomes of craft firms. Innovation outcomes may be product innovations, process innovations or a combination thereof. Product innovations are changes that are introduced by firms in order to meet a new or adjusted user or a market need. Process innovations are technological and organisational changes aimed at sales maximisation, cost reductions, shorter lead times and/or quality improvements of products or services (Asheim, 2001; Utterback and Abernathy, 1975). They aggregate value, create flexibility and/or enable learning in volatile global markets.

1.7 Research setting

The research is set within the global market of handicrafts, and in particular handicraft exports in Yogyakarta, Cape Town and Yiwu. The reasons for selecting handicraft exports as a case study are explored in section 2.2.2. This section defines and describes the international market on handicrafts, describes craft exporters, and introduces the three case studies.

1.7.1 The booming international market of handicrafts

Handicrafts are 'a unique expression of a particular culture or community through local craftsmanship and materials' (USAID, 2006). Products that express a culture or community are often used as home decoration and accessories, which are 'relatively small articles which serve as supplement to the large interior furnishing

[2] Agency is defined as the capacity of an agent to act in any given environment (Barker, 2003: 448). This study analyses proxy agency (called agency), which is when an individual acts on behalf of someone else, such as a firm, business association or other actor (Hewson, 2010).

products like closets, chairs, tables, etc.'. Examples are statuettes, picture frames, baskets or trays (CBI 2009: 44). Handicrafts have a symbolic value, based on traditional and contemporary symbols, which give meaning to aesthetic designs. They may also have a functional value, when symbols are incorporated into vases, baskets and other home accessories (Martin and Moodysson, 2011). The market includes handcrafted products, competing with semi-handcrafted and machine-made goods. The global market has changed from a local 'artisan' survival-economy to a global commodity market of over $30 billion/year. The export sector in emerging countries has grown by 11.8% annually in the period 2008-2012 (UNCTAD, 2015). Growing exports have been accompanied by growing competition and more refined market niches. The market is strongly influenced by aesthetic trends in the fashion industry and economic conditions in end markets (Sunley *et al*., 2008). Product innovation has become of crucial importance in responding to ever shorter product cycles, which have been reduced from 3 years to ½ year over the past decades. The prices of low-cost, mass produced commodities have been reduced through more capital-intensive production techniques. These low-cost products find their way into large retail stores, such as *IKEA*, TJ Maxx and Xenos, with global buyers operating as lead agents within the global value chain. In this low-cost segment of global markets, Chinese producers have been able to reduce costs, increase quantity and streamline delivery reliability at a fast pace (USAID, 2006). Firms face high entry barriers into this market segment, as large retailers demand high production capacities, low production costs, strict delivery dates, and specific labelling, packaging and packing. Payments are usually three months after delivery and delayed payment terms are customary (USAID, 2006). The growth of Chinese firms is confirmed by a Ghanaian exporter, who drily noted:

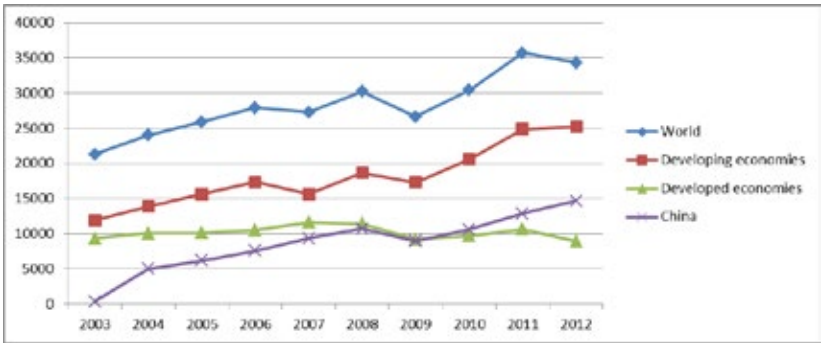
> '10 years ago I was a small firm and met a few Chinese firms at the fair. These days Chinese firms are large players and I am still a small firm'.

The result is that the increase in exports from developing and emerging economies mainly reflects a sharp increase in the market share of Chinese exports (see figure 1.3).

Firms in emerging economies other than China are better equipped to compete in the high end of the market, which appeals to the demand for ethnic, pure and hand-made products, be it decorative or functional. In this market segment, design and quality are critical success factors. Though some craft firms compete at the top end of this market with artistic designs, most operate within the larger, more competitive market of medium-priced products. Handmade ceramic pottery, baskets of natural materials and stone statuettes are typical examples of products that have witnessed a growing demand. Hand-made unique products soften

competition and lower entry barriers. This results in a chronic oversupply of (informal) survival-oriented producers, creating market asymmetries between small-scale producers on the one hand and global buyers on the other. Traders may link global buyers to poverty-driven but culturally skilled producers. They may coordinate small suppliers, introduce new designs from global buyers, maintain quality control and improve delivery reliability. However, as suppliers tend to be lowly educated, survival-oriented and risk-averse, it is often complex and time consuming to introduce innovation (UNCTAD, 2008 and 2010; USAID, 2006).

Figure 1.3 Export trends in art and crafts (mln US$, current price and exchange rate)



Source: unctadstat.unctat.org (25 November 2015).

Despite these challenges, growth rates of exports from developing countries have been hovering around 14% annually in the period 1995 – 2012. It seems that firms operating in the upper market segment have been able to innovate using the talent and richness of their cultural tradition and heritage. With growing tourism, local markets -though still relatively small- provide an expanding breeding ground for suppliers (UNCTAD, 2008 and 2010; DTI, 2005). This optimistic line of thought is part and parcel of the hype surrounding the cultural economy and more specifically the creative industry. The creative industry has grown to 3.4% of world trade and has grown particularly fast in (some) developing countries. ICT creates opportunities not only for knowledge creation, but also for linking SMEs to global markets (UNCTAD 2008, 2010).

1.7.2 HANDICRAFT EXPORTERS IN EMERGING ECONOMIES

This section describes craft exporters in emerging economies based on a survey of 301 exporters conducted in Cape Town, Yogyakarta and Yiwu. The research methodology is detailed in chapter 3, the questionnaire is presented in annex 1, the checklist of semi-structured interviews in annex 2 and the main survey results in annex 3. The section first describes the median craft exporter, followed by a brief analysis of the diversity of firms.

The median craft exporter, based on the data in annex 3, has an approximate turnover of US$200,000/year and employs 21 people. The firms' organisation most likely comprises management, production, marketing and/or design departments. The firm is likely to sell and/or produce a variety of handicrafts made of synthetic material (18.2% of all firms) or made of a combination of materials (17.9%). An example of the latter is a mirror made of metal work, mosaic and glass. Other popular products are wooden articles such as masks and baskets (17.9%), pottery (13.6%) and metal sculptures (12.6%). The median firm has been in existence for 11 years and is owned by a local entrepreneur (85% of all firms). The entrepreneur is likely to be a male (78%) who is 42 years old, with a higher level of education (59.5% have a polytechnic or university degree). He/she speaks foreign languages (77%), regularly travels abroad (55%) and has previous experience (75%), most likely in another craft firm where he/she has learned the trade (39%). Both the entrepreneur and staff are trained regularly. Furthermore, the firm has a business plan (68% of all firms) and invests in innovation (68%) from its own funds (60%). The entrepreneur considers him/herself to be moderately risk taking.

Coming closer to the topic of this thesis, the firm perceives itself to be innovative (a median score of 4 out of 5). It is more likely to innovate products than production processes, resulting in higher quality products over time (median score of 4 out of 5). Product prices or quantities do not increase easily, due to toughened competition (scores of 3 out of 5). The most important sources of knowledge are the global buyer, the Internet and trade fairs (scores of 4 out of 5). The firm fully trusts its global buyers (score of 5 out of 5), and about half of all exporters use the buyers' designs and/or ideas (scores of 3 out of 5 each). The firm is likely to sell to over 25 global buyers, with on average 30 percent of all sales to its main client. When global buyers offer designs to craft exporters, these are for their exclusive use. However, most craft exporters incrementally develop new designs by combining knowledge from global buyers, the Internet and trade fairs, and to a lesser extent local firms (scores of 3 out of 5 for knowledge exchange and observation). Much less importance is attached to knowledge of non-firm actors (scores of 1 or 2 out of 5). Most firms sell products under the brand name of global

buyers, but also sell some products in their own brand name in global (58%), national and local (51%) markets.

The median craft firm furthermore aims to strengthen its position in global markets, but this ambition proves to be difficult. First of all, not many firms have balanced competences (19%) and hence cannot combine new products with market and process innovations. They tend to remain dependent on the marketing of buyers and traders. Furthermore, product designs and technologies are often copied by other craft firms (noted by 76% of all firms). Most firms take measures to protect their designs, technologies and/or clients (71%). They may use a variety of strategies, ranging from only working with trustees (27%), patenting (20%), speeding up innovations (23%) and/or specialising in complex designs, which are more difficult to copy (18%).

There is considerable variation in craft exporters within and between territories. This variety is most pronounced in the firm sizes. At the one extreme, 18 entrepreneurs run their firm on their own. Most of these firms are highly specialised. This includes for instance respondent #26 in Yogyakarta, a 63 year old man who produces and repairs Javanese metal crafts for international and local clients (see picture 1). He has highly specialised traditional skills. Buyers give designs to him, and he adds a traditional Javanese touch. At the other extreme, a firm in Yiwu employs 15,000 people with a turn-over of US$ 1.6 billion/year (see picture 2). The firm mass produces picture frames and paintings and employs hundreds of painters and designers, whom copy paintings and picture frames from the Internet and slightly adjust these. The firm also incrementally innovates its production processes and marketing mechanisms.

The variety of firms can also be illustrated by comparing firms that strategize product innovation with those that primarily innovate production processes. For instance, respondent #58 in Cape Town designs and produces folded wooden masks of animals (see picture 3). She is a 38-years old designer producing eco-friendly products. She has sold a few hundred of these products and now focuses on new designs. Respondent #126 in Yiwu, by contrast, focuses on process innovation (see picture 4). The firm was the first in Yiwu to produce artificial flowers and the first to put these into pots. It buys pressing machines in Taiwan, and adjusts and improves their efficiency. The firms' main strategy is to increase product quality and reduce the costs of production. Annex 3 reports in greater detail on the differences between firms across the three case studies. The subsequent sections describe the institutional regimes and craft exporters in each of the case studies.

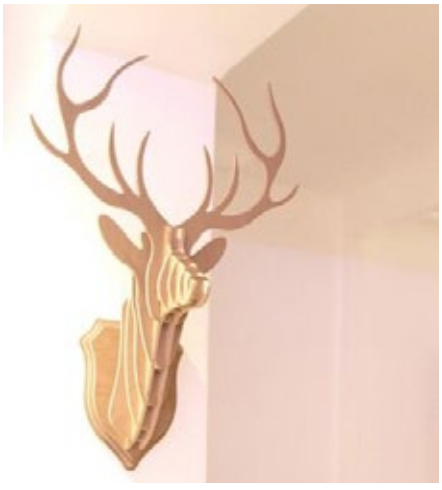
Picture 1 Smallest firm

Source: author

Picture 2 Largest firm

Source: www.instapainting.com/blog/ company/2015/10/28/ how-to-paint-10000-paintings

Picture 3 Wooden mask of respondent #58 in Cape Town



Source: https://handsomethings.files. wordpress.com/2011/06

Picture 4 Mass production of artificial flowers by respondent #126

Source: author

1.7.3 YOGYAKARTA (INDONESIA)

Yogyakarta is renowned as a centre of Javanese art, including (wooden) batik, pottery and filigree silverware. Compared to the other two case studies, firms are

more likely to produce wickerwork and stone sculptures (see annex 3). In 2003, about 40% of all enterprises in the industry sector were involved in the creative industry, of which handicrafts is by far the largest segment (Fransen and Tuyl, 2017).

Yogyakarta's business system is supportive of creative small firms. Since the 1980s/90s, Indonesia's industrial policies and programmes stimulate exports of SME's and local materials (Wengel and Rodriques, 2006), especially in Yogyakarta (Shima *et al.,* 2006). At the same time, qualitative data reveals that innovation policies and programmes have received relatively little attention. This is also indicated by the limited importance that firms attach to the knowledge of governments and intermediate organisations (see annex 3).

The innovation system within which craft exporters in Yogyakarta operate integrates knowledge acquired from global value chains and the local innovation system. Respondent #7, for instance, invites his global buyers to stay in his house when they visit Yogyakarta (see picture 5). He organizes their holidays and visits them whenever he can. This investment in a trustworthy relationship gives access to the latest knowledge. New concepts, production technologies, designs and prices are discussed informally. Local knowledge exchange is moderate to strong, especially within clusters (see annex 3). Knowledge from global buyers is combined with local knowledge. Traders and suppliers exchange knowledge on-the-job, when they jointly innovate products and production processes, and when traders support suppliers' production processes. Creative designers have furthermore established communities of practice, where they share design ideas. However, these relatively new and vibrant knowledge networks are hardly supported by non-firm actors, and their services are generally perceived as

Picture 5 Respondent #7, a trader

Source: http://jogjabagus.com/handicraft/

Picture 6 Respondent #8, a supplier

Source: author

bureaucratic, of poor quality, and possibly corrupted (Indarti, 2010; Ismalina, 2011; Shima et al., 2006; Respondents #2, 3, 6, 8, 9, 10, 11, 13, 14, 16, 25, 32). Instead, innovation support is focused on the traditionally clustered suppliers.

Compared to the other two case studies, firms in Yogyakarta are more likely to combine product and process innovations. Traders play an intermediate role, linking global buyers to suppliers. Respondent #7, for instance, trades pottery within the Kasongan pottery cluster (see picture 5). The firm employs 50 staff for sales, marketing, design, packaging and finishing of products. Production is subcontracted to about 50 suppliers within and around the cluster. The entrepreneur started trading in 1990, after completing a Masters degree in art and design. According to the subcontractors the firm offers the best designs and production techniques. By contrast, respondent #8 supplies pottery to traders. The supplier employs about 50 staff and primarily invests in larger ovens in order to reduce production costs (see picture 6).

1.7.4 Cape Town (South Africa)

Cape Town is well known for its African and contemporary crafts, ranging from pottery to metal sculptures, paintings, silverware and recycled plastics. The sector comprises over 2,500 firms. It includes large trading houses and suppliers who operate internationally. However, the sector also includes small poverty-driven suppliers operating from their homes in squatter settlements. The sector is found to be segmented between formal and informal firms. The analysis, as presented in chapter 5, reveals that formal firms closely cooperate with the government, intermediary organisations and internationally reputable universities. At its heart is the business improvement district, called 'the fringe': an area where formal suppliers, a university and intermediary organisations are housed. Other suppliers are clustered around market places selling handicrafts. The firms benefit from regulations, sophisticated support systems, and a well-developed financial and educational system (Ashman and Fine, 2013; Bischoff and Wood, 2013; DTI, 2005; Kaiser Associates, 2009; Kruss *et al*., 2010). Qualitative data reveals that support is coordinated by, among others, the Cape Craft and Design Institute (CCDI) and concretely focuses on clustered craft firms in and around Cape Town. Global buyers visit Cape Town in order to explore innovative product designs. The search is eased by regular trade fairs, conferences, websites and city marketing. At the same time, the international integration of craft firms is relatively weak and firms are not very likely to use the buyers' designs (see annex 3).

Relatively strong state coordination stimulates the emergence of a strong local innovation system. Craft firms benefit from innovation policies, implemented by

intermediary organisations such as CCDI. Surprisingly, however, respondents score local knowledge exchange only as moderate (see annex 3), while qualitative data and observations show that firms strongly exchange knowledge locally. This is indicated by respondent #58 from Cape Town:

> 'We share the floor of this building … with three firms. … We especially collaborate in marketing. Interior designers approach us as a team. We always help each other. We talk about new ideas. We bounce ideas. We use the same suppliers, inform each other.'

Respondents have mentioned numerous similar examples of intense knowledge exchange among highly creative designers and support organisations. It appears that product design has become an implicit way of life. At the same time, knowledge from global buyers is not as regular as in the other territories (as indicated by a low dependency of the business system), but it is equally well appreciated, because it brings in new ideas (see annex 3).

Strong local coordination conditions the firm characteristics and innovation outcomes. As firms cooperate locally, they do not need to have all competences in-house, and as firms do not export in large quantities, they remain relatively small (see annex 3). Therefore, most formal firms are specialised small firms, often owned and managed by designers or artists. Respondent #3, for instance, produces metal bead sculptures (see picture 7). The entrepreneur started 6 years ago as a survivalist producing and selling metal beads on the streets. Ever since, he has received a lot of support in building up the firm and improving product designs. He presently employs 25 staff and has an annual turnover of about US$100,000, well

Picture 7 Respondent #3 in Cape Town

Source: www.timeslive.co.za/sundaytimes/2011/10/16/art-inspired-by-nature-and-culture

below the average turnover of firms in Cape Town.

About 25 percent of all formal craft firms subcontract production to informal craft firms, ranging from an irregular and occasional small order to regular and continued subcontracting to a network of 450 informal firms. Informal firms tend to be owned by lowly educated entrepreneurs. The firms are risk averse and poverty-driven. Most firms do not employ staff. Informal firms operate at the bottom of volatile global value chains.

1.7.5 YIWU (CHINA)

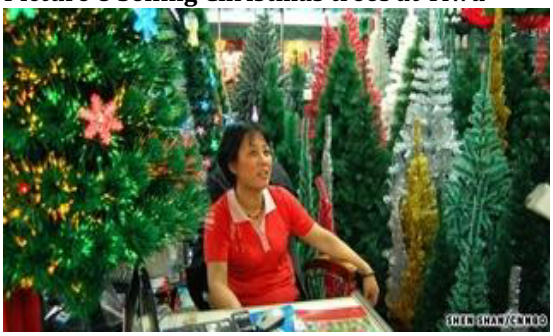
Yiwu is known for its rapid economic development based on low scale, low-technology trade and industrialisation (Forste, 2000). It comprise one of the largest if not the largest hub of handicrafts in the world (Akoori and Ding, 2009; Bellandi and Bombardi, 2012; Si *et al*, 2012). Craft products made in and around Yiwu include sculptures, paintings, picture frames, Christmas products, toys and pottery. These are often made of synthetic materials, wood or a combination of materials (see annex 3). The sector comprises roughly 70,000 firms, 13,000 global buyers with local offices, and 40,000 visiting buyers on a daily basis. Simple, cheap and convenient products target the low end of the market. In some subsectors, such as Christmas products, Yiwu has a global market share of over 50% (Yiwu, 2014). Interestingly, the craft sector in Yiwu is not dominated by multinationals, but mainly comprises local family-owned SMEs (Si *et al*., 2015: 122).

Yiwu's business system is strongly influenced by international actors, as indicated by the importance attached to interactions with global buyers and by the regular use of buyers' designs. Buyers are also more likely to know the profit margins of Chinese suppliers than of their counterparts in Yogyakarta and Cape Town. By contrast, interactions with local buyers are not perceived as very important (see annex 3). Qualitative data reveals that the government and intermediary organisations strongly support exporting firms through industrial policies and programmes, while controlling access to resources, such as land, water users' rights, permits, labour markets, local markets and subsidies (Mitussis, 2010; respondents # 71, 100, 102, 104, 105, 128, 130). On the other hand, the role of the government and intermediary organisations in knowledge generation, exchange and diffusion is limited. Fu and Gong (2011) note that China's ambitious innovation policies do not focus on low-tech SMEs sectors (respondent # 129). It also appears that networking between government, intermediate organisations and firms does not evolve around knowledge exchange, but around access to resources (Mitussis, 2010; respondents #1, 31, 122, 107, 108, 129, 131).

As already hinted at above, Chinese suppliers are likely to depend on knowledge from global buyers, such as *Action, Big Bazaar* and *Blokke*r. Suppliers are likely to sell to many buyers. On the other hand, relatively many Chinese suppliers depend on brands, designs and markets of global buyers (see annex 3).

Firms in Yiwu are significantly larger and more capacitated than their counterparts in Cape Town and Yogyakarta. They are more likely to produce to scale, keep production and knowledge in-house and protect their designs, prices, clients and production techniques. Their level of product innovation is significantly lower, while that of process innovation is significantly higher. Firm sizes vary from 2 to 15,000 people, with a median of 80 staff. Most firms partly sell to global buyers directly and sell at arm's length at the wholesale commodity market (see annex 3). Respondent #101, for instance, is one of the hundreds of firms producing and selling Christmas products. She employs 30 staff, runs a small workshop and has a stall at the wholesale market. She sells her products to about 20 long-term clients and at arm's length. When a group of buyers from Russia walks in during the interview, she says: "O, they come every year'. She explains that her firm constantly innovates products and reduces production costs by incrementally adjusting the designs of their long-term buyers and by observing competitors at the market and on the Internet.

Picture 8 Selling Christmas trees at Yiwu



Source: www.yiwu-market-guide.com/yiwu-christmas-decorations.html

1.8 LIMITATIONS OF THE STUDY

The study suffers from four limitations. The first limitation is that the sector of handicraft exports is diverse. It ranges from firms operating in low- to high-priced market segments and from applying low to intermediate levels of technology. Furthermore, these exporting firms operate in different institutional regimes. The firms have in common that they all compete in the global market of handicrafts. The diversity of the study population potentially limits the robustness and validity of the findings. While the validity is ensured by controlling the analyses for market and product segments, the limited robustness of the findings remains a weakness

and results should therefore be treated as illustrative cases. There are however various reasons for choosing such a diverse research setting. First, the study of diverse sectors is a common practice in innovation studies. Examples are studies within the broad field of life sciences (Cooke, 2004; Moodysson et al., 2008; and many others), the biotechnology industry (see for instance Sternberg and Muller, 2005) and the diverse software industry (Chaminade and Vang, 2008; Strambach and Storz, 2008). Sunley et al. (2008) study innovation in design as a creative industry, a sector as diverse as handicrafts. Also the automobile industry is often studied and is highly diverse (see for instance Sturgeon et al., 2008). The sector selection therefore fits into an academic tradition. A second and more important reason for choosing such a diverse setting is that it enables a *better understanding of diversity in itself*. It offers illustrative cases that show how evolving institutional regimes have led to a concentration of mass producing process innovators in Yiwu, as opposed to product innovators in Cape Town and a combination of the two in Yogyakarta. Further research is recommended in order to improve the robustness of the findings.

The second limitation is that the generalisation of findings is restricted, due to the focus on craft exporters in only three case studies. The study was limited to three case studies due to time constraints. Despite its limited scope, the study aims to draw theoretical generalisations by recommending a new exploratory model for further research. Theoretical generalisation is enabled by the analytical approach that was taken. The study has moved beyond a co-variational analysis, which only allows for statistical generalisation, to process tracing and congruence analysis (Blatter and Blume, 2008). Process tracing aims to make inferences about the most convincing explanation of innovation, in which ways and to which degrees (Bennett, 2010). It is 'the systemic examination of diagnostic evidence selected and analysed in light of research questions and hypotheses posed by the investigator' (Collier, 2011: 823). The phenomena are first described, after which the sequence of events is analysed. Such an explanatory approach in case study research enables a researcher to draw conclusions on possible causal configurations and mechanisms leading to innovation. A congruence analysis compares which comprehensive theory has more merit in describing and analysing a contemporary phenomenon. It is fundamentally theory-centred, while a co-variance analysis is variable-centred and process tracing is case-centred. This study has compared the processes that were traced with theoretical discourses. This approach, contrary to a co-variance analysis, enables theoretical generalisations. However, the study cannot exclude that other factors may explain incremental innovation in other territories and/or sectors.

A third study limitation is that informal institutions are not fully taken on board. The study focuses on trust as a key informal institution, as is common in

innovation studies. I strongly recommend more research that includes informal institutions.

A final study limitation is that the evolutionary analysis is not as powerful as preferred, since the analysis does not include quantitative time series. As data triangulation is limited to qualitative data, the reliability of the evolutionary analysis is somewhat restricted. Initially, I did not collect time series data, since I did not anticipate an evolutionary analysis. Only an analysis of the static innovation system and its context were foreseen. However, during data analysis it became clear that the case studies, and especially those on Cape Town and Yiwu, could not be properly understood without an additional evolutionary analysis. At that moment in time, it was decided not to collect quantitative time series data for three reasons: (1) databases with reliable and valid information were not available, (2) recall data over such a long period of time have inherent weaknesses, and (3) time constraints. It was felt that quantitative recall data, even if available, would be unreliable. Instead, more qualitative data and secondary data were collected and analysed.

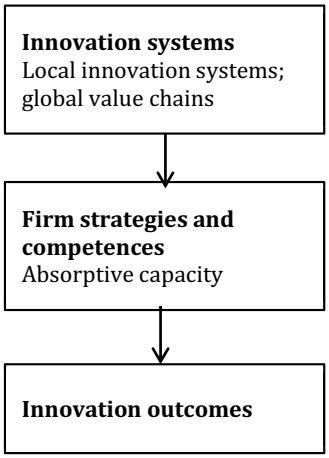
1.9 STRUCTURE OF THE REPORT

The report is structured as follows. Chapter 2 offers a literature review. It describes the viewpoint of innovation systems and its challenges, and discusses how institutional regimes and their evolution can contribute to a multilevel understanding of incremental innovation in emerging economies. This culminates in the analytical framework, as introduced in section 1.6. Chapter 3 describes the research methodology.

Chapters 4, 5 and 6 subsequently analyse the case studies. These chapters aim to explain the differences in innovation outcomes between firms within the case studies. During the course of the case studies, the theoretical framework evolved and expanded. The first case study only applies a subset of the theoretical framework presented in chapter 1.6, the second case study applies a larger subset and the third case study and comparative analysis apply the full theoretical framework. The chapters presenting the case study analyses therefore reflect the evolution of the theoretical framework over time.

The first case study on Yogyakarta applies the smallest subset of the institutional framework (see figure 1.4). It analyses how the innovation system, mediated by firm strategies and competences, explains innovation outcomes. Concretely it applies core concepts, by analysing how absorptive capacity, as a main component of firm competences in emerging economies, mediates the impact of global value chains and local innovation systems.

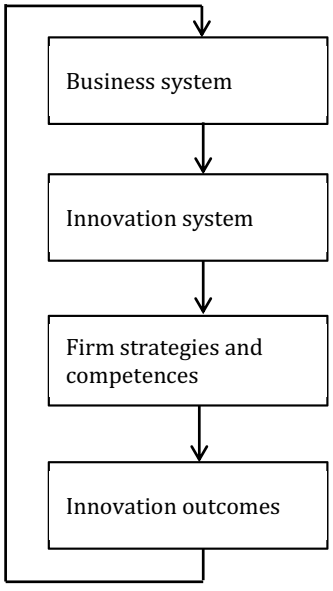
Figure 1.4 Theoretical framework of the Yogyakarta case study



I wanted to apply the same theoretical framework to the second case study in Cape Town, but this yielded no significant results (chapter 5). Instead, it was found that the path dependent segmentation of the higher-level business systems conditioned the way that the innovation system works and firms innovate. The study therefore added the business system as a higher subsystem within institutional regimes and assessed how path dependence could explain segmentation of the business system, and hence differences in innovation outcomes (figure 1.5). The section briefly considered path creation as well, but found that craft exporters breached the segmentation barriers, but no new development paths were created.

Figure 1.5 Theoretical framework in the Cape Town

Path dependend subsystems



When this more elaborate theoretical framework was subsequently applied to the third case study in chapter 6, Yiwu, the study results showed that the institutional regime had renewed itself twice over the past decades. The study therefore added additional concepts on path renewal. This resulted in the final theoretical framework.

Chapter 7 subsequently offers a comparative analysis. It describes differences between the three case studies, and analyses how the institution configurations and their evolution explain these differences. This section applies the full theoretical framework to all three case studies, based on additionally collected data. Finally, chapter 8 offers conclusions and recommendations.

2 LITERATURE REVIEW

ABSTRACT

This section positively but critically explores three perspectives that may explain incremental innovation of craft exporters in emerging economies. The first perspective is that of innovation systems. Ever since 1987, studies on innovation systems have greatly contributed to our understanding of innovation. Scholars on innovation systems in emerging economies have added the notion that innovation of firms in emerging economies differs from that in developed economies, since they are more likely to absorb knowledge from global value chains, local innovation systems and other sources. The second perspective is that of business systems, which claims that national institutional differences explain differences in innovation outcomes between countries. The perspective highlights the coherence of institutions, actors and networks within a country, but it tends to ignore differences within countries and between international contexts. The chapter subsequently explores an evolutionary perspective in order to appreciate if, why and how innovation within a territory is predictable over time. It especially considers institutional path dependence. The chapter concludes that each of the three perspectives has merit, but is underdetermined and descriptive, and therefore combines the three perspectives into one. This combined perspective is worked out in an exploratory framework, which is multilevel and multi-spatial. Within the proposed framework, territories have distinct institutional regimes which affect innovation. The regimes comprise business systems, innovation systems and firms. They evolve in processes unique to the territory and sector. Generally speaking, the evolutionary processes are stable and predictable, but these periods of relative stability are likely to be intertwined with outbursts of path creation, renewal and/or destruction.

2.1 INTRODUCTION

This chapter explores three perspectives that aim to explain incremental innovation in emerging economies: innovation systems, business systems and institutional path dependence. The chapter takes a positive but critical stance towards each of these perspectives. Each perspective adds to our understanding of incremental innovation and is seen to be consistent in itself, but is at the same time underdetermined and often used descriptively. At the same time they are complementary, because they answer different research questions. The chapter combines the three perspectives into one and translates this into an exploratory model.

The first perspective is that of innovation systems, defined as the systemic interaction of knowledge among firms, government and intermediary organisations (Tödtling *et al.*, 2009). Ever since Lundvall introduced the concept in 1987, studies on innovation systems have greatly contributed to our understanding of innovation. Scholars on innovation systems in emerging economies have added the notion that innovation of firms in emerging economies differs from that in developed economies, since they are more likely to absorb knowledge from global value chains, local innovation systems and other sources (Chaminade and Vang, 2008; Pietrobelli and Rabellotti, 2011). Many scholars use the concept in a descriptive manner, explaining innovation differences between firms within a given innovation system. Systemic differences between innovation systems across space and time are only rarely studied (see for instance Binz *et al.*, 2014). This perspective is therefore especially applicable in understanding innovation differences within a territory. It has been applied in the Yogyakarta case study (chapter 4).

The second perspective is that of business systems, defined as the coordination of national economies by the government, firms and intermediary organisations such as business associations, universities and NGOs. This perspective entails that differences in the rules that govern a local economy, and in the role and capacities of the actors that set and implement those rules, result in significant and enduring innovation differences between countries (Hall and Soskice, 2001; Whitley, 1992). Amable (2000: 645) aptly calls business systems 'social systems of innovation and production', indicating that the economy comprises a world of production (product creation and exchange) intertwined with a world of knowledge (knowledge creation, diffusion and exchange). This perspective is thus broader than that of innovation systems, which is limited to the world of knowledge. Geographically speaking, the perspective focuses on differences between countries. Even though scholars have started studying differences within countries and in international

contexts, its application to a study of exporting crafters in a specific local setting demands a critical assessment of the perspective.

The chapter subsequently explores an evolutionary perspective in order to appreciate if, why and how innovation within a territory is predictable over time. It especially considers institutional path dependence, which explains how the slow change of formal rules and informal norms and values results in predictable innovation outcomes over time. As Martin and Sunley (2006) argue, (innovation) outcomes evolve as a consequence of their own history. However, path dependence does not offer a coherent theory of economic evolution in itself, but instead has to be embedded into another theoretical perspective (Martin, 2012). To be more specific: innovation systems and business systems can be seen to evolve in institutionally path-dependent patterns, enabling an understanding of innovation outcomes based on an analysis of the history of business and innovation systems. Such a perspective is expected to be suitable in handicrafts, which, as a mature industry, is likely to be path-dependent due to institutional rigidity, vested interests and sunk costs. In such a context, new development trajectories are considered to be highly unlikely (Boschma and Frenken, 2006; Esslitzbichler and Rigby, 2007; Geels, 2004; Martin and Sunley, 2006).

The chapter concludes that each of the three perspectives has merit, but none fully explains incremental innovation in emerging economies, nor do they claim to do so. The chapter subsequently combines the three perspectives in order to increase their explanatory power. It proposes a multilevel exploratory model, within which factors at various spatial and institutional levels may explain differences in incremental innovation of craft exporters in emerging economies. The spatial levels influencing innovation are the firm, territory, nation and international economy. The reason is that exporting craft firms network locally, nationally and internationally. These multi-spatial networks, and the institutions and actors that influence them, potentially impact on their innovation outcomes (Coe *et al.*, 20-04; Dicken *et al.*, 2001; Henderson, 2004). The different institutional layers of analysis are the business system, the innovation system and the firm. This approach is based on the notion that institutional regimes are nested, whereby higher level institutions condition lower levels (Amable, 2000; Helmsing, 2013; Rafiqui, 2009; Williamson, 2000). The proposed analytical framework is dynamic, whereby the multiple levels of institutional regimes are expected to co-evolve in processes unique to a territory and sector. Generally speaking, the evolutionary processes are expected to be stable and predictable, but these periods of relative stability can be intertwined with outbursts of path creation, renewal and/or destruction (Boschma and Frenken, 2007; Crouch, 2005; Martin and Sunley, 2006).

The chapter is structured as follows. Section 2.2 describes and positively critiques innovation systems. Sections 2.3 and 2.4 analyse if and how business systems and institutional path dependence contribute to the understanding of incremental innovation. Section 2.5 subsequently proposes a combined exploratory model. The model includes ideal type institutional regimes that are likely to arise, the factors that potentially explain innovation at different spatial and cognitive levels, and likely innovation outcomes. Section 2.6 draws conclusions and describes how the theory is applied in the case studies.

2.2 INNOVATION SYSTEMS

2.2.1 DESCRIPTION

Lundvall introduced the perspective of a 'national innovation system' in 1987, as a critical response to the then dominant neo-liberal approach to development. The concept emphasizes the importance of national institutions, actors and networks in innovation processes. It became widely used by scholars and policy makers, as it responded to an urgently felt need for integrated policies on innovation (Lundvall *et al*., 2010). Over the years, the application of the concept has expanded to regions, as knowledge exchange takes place within local ties of trust (Asheim *et al*., 2009; Cooke, 2001 and 2004a), and to sectors and technologies, as innovation systems are specific to technological regimes (Malerba and Nelson, 2011). Its conceptualisation over time is described in greater detail by among others Doloreux and Parto (2005), Edquist (2001), Fagerberg (2005), Goel (2004), Lundvall (2007) and Lundvall *et al*. 2010).

Lundvall *et al*. (2002) explicitly include competence building and learning in their conceptualisation of national innovation systems. However, Lundvall (2007) argues that in retrospect such a conceptualisation is comprehensive but also blurry. Defined in a narrower sense, a well-functioning national innovation system offers knowledge exchange and joint knowledge creation at a faster pace and lower cost (Asheim *et al*., 2009; Tödtling *et al*., 2009). This enables firms to overcome knowledge asymmetries. Knowledge is exchanged in collaboration among actors, and it spills over through monitoring, copying and labour mobility (Martin and Moodysson, 2011; Tripple and Tödtling, 2008). Knowledge may be exchanged among firms, non-firm actors, and clients. Producer-user interaction enables firms to adjust to specific demands from their customers. This is especially important in demand-driven and trend-sensitive sectors such as handicrafts (Chaminade and Vang, 2008; Gertler *et al*., 2000; Moodysson and Martin, 2010). Interaction

patterns comprise the frequency and intensity of interactions. The more frequent and intense interactions are, the more depth an innovation system has. The more actors are involved, the broader an innovation system is (Choi *et al*., 2011).

Bounded rationality implies that actor's first search for new knowledge in areas within which they are most familiar (Dosi 1997). This is likely to be within physical, social and organisational proximity (Boschma, 2005). Knowledge exchange with trustworthy local sources also reduces uncertainty, as possibilities of opportunistic behaviour are reduced. Monitoring, copying and labour mobility are eased by proximity as well (Asheim *et al*., 2009; Asheim and Isaksen, 2002; Boschma, 2005). Innovation systems are therefore expected to be local, whereby knowledge exchange takes place within a bounded economic space.

2.2.2 CHALLENGES

While the innovation system perspective has contributed greatly to our understanding of innovation as a social process, its application to incremental innovation in emerging economies is far from straightforward. I will discuss five challenges.

The first challenge is that innovation system studies are generally focused on radical innovation in the initial stage of the product cycle (Jensen *et al*., 2007; Lundvall *et al*., 2010; Martin and Moodysson, 2011). Eye-catching radical innovations mainly take place in high-tech sectors, such as IT and automobiles. These have led to structural economic change (Edquist *et al*., 2001: 10-11; Gertler and Vinodrai. 2009; Lorentzen, 2009). Generally speaking, radical innovation takes place in territories with high levels of physical and cognitive proximity. These territories are seen as best practices, while studies in other territories tend to question whether conditions for radical innovation are in place or not.

Emerging economies, on the other hand, generally operate in maturing and mature product markets. When a product matures, product designs are standardised and process innovations take centre stage in order to increase productivity. For mature products, the third stage of the product cycle, product and process innovation become less important (Utterback and Abernathy, 1975). In these latter stages, innovations are incremental, with a focus on minor process innovation (Hobday *et al* 2004 in Lorentzen 2009).

A second challenge of the innovation system perspective is its implicit focus on product innovations. A main reason is that product innovations depend to a greater extent on knowledge spillover in innovation systems, as they are easily observable (Damantour and Gopalakrishnan, 2001). By contrast, process

innovations are less observable and are therefore less likely to spill over (Ornaghi, 2006). A second reason is that product innovations are perceived to be of greater importance than process innovations, since they are the core product of firms, are more visible and are expected to result in significant price premiums. Boschma and Frenken (2007) even argue that economic growth stems from product innovations. By contrast, most process innovations take place on-the-job in production departments and are aimed at cost reductions (Damanpour and Gopalakrishan, 2001). Process innovation is common in mature industries in emerging economies and greatly contributes to the development of efficiency-driven industries and services (Lorentzen, 2009; Utterback and Abernathy, 1975).

A third challenge is that innovation processes in emerging economies tend to differ from those in developed countries, because in the absence of up-to-date local knowledge most firms in emerging economies absorb knowledge from global value chains instead. A slowly growing body of literature seeks to establish how global value chains and local innovation systems co-relate (Altenburg *et al*., 2008; Asheim and Isaksen, 2002; Belussi and Sedita, 2011; Chaminade and Vang, 2008; Criscuolo and Narula, 2008; Ernst, 2002; Ernst and Kim, 2002; Fu *et al*., 2011; Giuliani, 2005 and 2011; Humphrey and Schmitz,2002; Lundvall *et al*., 2010; Pietrobelli and Rabbellotti, 2011; Sturgeon *et al*., 2008; Vang and Asheim, 2006). However, this field of study is young and the co-relations are not yet well understood.

A fourth challenge is that international comparison based on the innovation system perspective is deeply problematic, because it zooms in on the world of knowledge and excludes the underlying world of production. However, the institutions and actors governing the world of production strongly differ between territories and influences innovation as well, especially process innovation. Of particular importance is the ability of a territory to build competences of firms through education, training and business development services (Lundvall *et al.*, 2002). Closely related is the ability of a territory to attract new, capacitated firms through attractive industrial policies. New firms may create new innovation opportunities, especially in territories where the gap between prior and new knowledge is large (Sternberg and Muller, 2005). Finally, functioning product markets create market incentives for innovation (Lundvall, 2007). Any international comparative study should at least control for the variety of these production factors.

A fifth challenge is that innovation system studies are likely to take a snapshot of time, implicitly assuming that the innovation system is stable. These static studies ignore that innovation systems evolve in historic processes and are therefore unable to appreciate their changes over time. The past decades in emerging economies illustrate that the innovation systems have been anything but stable.

Generally speaking, the innovation system perspective has been unable to understand and predict these evolutions.

Due to these challenges, the straightforward application of innovation system perspectives to incremental innovation in emerging economies is troublesome. However, various scholars have adapted the concept for application in emerging economies.

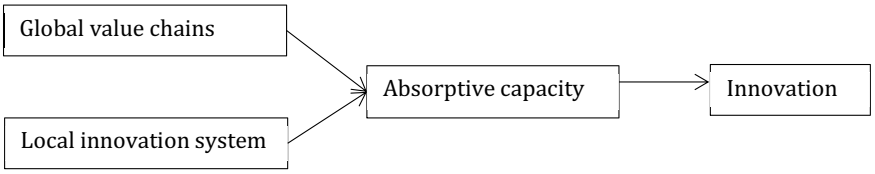
2.2.3 INNOVATION SYSTEMS IN EMERGING ECONOMIES[3]

The past decades have witnessed a remarkable increase in the level of industrial innovation in emerging economies. This is indicated by the growth in patents, relocation of research activities to emerging economies, and by a transition from production to innovation (Altenburg *et al.*, 2008; Fu *et al.*, 2011; Goel, 2010; Morrison and Pietrobelli, 2008). Capacitated firms have been able to benefit from expanding innovation opportunities in international markets. These opportunities have partially expanded due to sharply reduced costs of innovation. Soft, non-technical innovations increasingly add a competitive edge at relatively low-cost, stimulating an ever larger number of firms to innovate. Even a few informal home-based enterprises in squatter settlements in Yogyakarta have been reported as having introduced e-marketing (Fransen and Gaul, 2016). At the same time, the potential number of innovation trajectories has multiplied, due to market diversification, fragmentation and segmentation, and a growth of local markets. Opportunities have been furthered by transformations in global value chains: from supply-driven to demand-driven, and from (quasi-) hierarchical to relational (Ernst, 2002; Gereffi, 2014; Goel, 2010).

This section discusses if and how innovation system perspectives can explain the upsurge in, and the levels and types of incremental innovation in emerging economies. The concept of 'National Innovation System' on its own cannot explain the innovation of firms in emerging economies. National Innovation Systems in emerging economies often lack access to the latest knowledge on market trends, technologies, designs and production processes (Chaminade and Vang, 2008; Pietrobelli and Rabellotti, 2011). Firms in emerging economies tend to absorb cutting-edge knowledge from global value chains instead. They innovate by combining cutting-edge global knowledge with applied local knowledge of production processes, production costs and local designs. This anticipated innovation process is presented in figure 2.1.

[3] Chapter 4, which discusses the findings of the case study on Yogyakarta, adopts the perspective presented in this section.

Figure 2.1 Anticipated innovation processes in emerging economies



Global value chains

Exporting firms in emerging economies tend to acquire knowledge from global value chains, defined as the full range of activities required to bring a product or service from conception to final customers and disposal after use (Kaplinsky and Morris, 2000: 4). Suppliers join global value chains in order to gain access to international markets at relatively low transaction costs. Otherwise, the quest to search for far-away markets and the challenge to adhere to a multitude of industrial standards would become too time-consuming and expensive. It is far from easy to remain abreast of and apply industrial standards related to product quality, health, safety, labour conditions, delivery times, payment schedules, etc. (Nadvi and Waltring, 2004). In buyer-driven global value chains such as handicrafts, global buyers can ease access to international markets and to knowledge on international standards. In return, global buyers tend to keep a firm hold of lucrative activities, such as branding, marketing and product design (Altenburg *et al*., 2008).

Acquiring knowledge from global value chains can enable sustained and systemic innovation of firms in emerging economies, but this process is far from automatic (Lall, 2003) and depends on the roles of firms in global value chains and on modes of governance (Gereffi *et al*., 2005). I describe three roles that are common in buyer-driven value chains: global buyers, traders and suppliers. Global buyers tend to be the 'lead firm'. They are wholesalers that manage brands and set and control standards, often without producing themselves (Saliola and Zangfei, 2009: 371). Global buyers prefer to work with a limited number of traders with a relatively high level of competences, linking them to suppliers. As traders have direct contact with global buyers, they can absorb international knowledge directly, adding to the territorial pool of knowledge (Criscuolo and Narula, 2008; Saliola and Zanfei, 2009). However, the ability of traders to absorb knowledge depends on their knowledge gap with global buyers, who tend to be more capacitated (Humphrey and Schmitz, 2002). Suppliers operate at a lower level in global value chains and

tend to have lower competences. They therefore acquire knowledge that is filtered by suppliers and offered with a time lag. As a result, traders are in a better position to absorb knowledge from global value chains than are suppliers, assuming they have the capacity to do so.

In their seminal work, Gereffi *et al*. (2005) attach deterministic importance to modes of governance and related strategies of global buyers. They identify five modes of governance:

1. *Arm's-length global value chains* do not offer an opportunity for incremental innovation, as impersonal markets do not cater for reciprocal knowledge exchange. Instead, firms innovate in-house, which demands a high capacity for understanding market incentives and for acting accordingly, or firms innovate within local innovation systems.
2. In *quasi-hierarchical global value chains*, suppliers depend transactionally on global buyers (Gereffi *et al*., 2005). Global buyers also tend to have more competences. Due to the asymmetrical relationship, innovation opportunities of suppliers are likely to depend on the strategies of global buyers. Global buyers may actively support innovation of suppliers in non-strategic areas, especially production processes, but are likely to block innovations in strategic areas such as brands, designs and markets. These lucrative and knowledge-rich activities are kept within the realm of the global buyers (Altenburg *et al*. 2008). Support in production processes may enable a high level of process innovation and fast learning tracks for new exporting firms. However, once the firm competences of suppliers increase, they become aware of the enlarged profit prospects if they innovate products and/or market themselves. As quasi-hierarchical global value chains may hinder product and market innovation, suppliers may start switching global value chains (Saliola and Zangfei, 2009).
3. In *hierarchical global value chains* the suppliers are owned by global buyers. This may offer innovation opportunities for local subsidiaries, but these chances depend on the strategies of the parent company. Comparable to quasi-hierarchical global value chains, suppliers are likely to focus on low-cost production. Their mother firm tends to support production to specification. Hierarchical global value chains are likely to operate outside local innovation systems, in order to protect their specific product designs, clientele and production processes (Gertler *et al*., 2000).
4. In *relational global value chains*, suppliers sell their products or services to many global buyers. This mode of governance provides broader innovation opportunities, as firms can acquire knowledge from a range of global buyers in reciprocal relationships (Gereffi, *et al*., 2005). Their level of innovation also depends on broader absorptive capacities, which enable firms to

constantly adjust products, processes and markets in order to reposition themselves within global markets (Dutrénit, 2004 and 2007).

5. In *modular global value chains*, the supplier has specialised in a product segment or service, which is sold under their own brand name to a range of global buyers. Highly specialised modular suppliers have themselves turned into leaders of global value chains. As in relational global value chains, they provide broad innovation opportunities, which are furthered by strong absorptive capacities.

Local innovation systems

A local innovation system, by contrast, enables systemic and sustained innovation through knowledge mediation, diffusion and creation within close physical proximity. Mediation entails foreign technologies being adapted to local conditions. This process benefits from the mediation by actors within the local innovation system (Lall, 2003). Knowledge diffusion entails (global) knowledge being spread across local firms. Knowledge creation, finally, entails that local knowledge interaction stimulates innovations.

Systemic innovation is fostered by the coordination of economic activities through non-market relationships. Public and private actors establish non-market relationships in order to exchange knowledge reciprocally (Humphrey and Schmitz 2002). However, these relationships are not always fully developed. Weak local innovation systems primarily innovate production processes. In order for firms to operate in exporting markets, they need productive capabilities, including capable, educated and trained staff. The local innovation system enables firms to build productive capabilities through education, training, business development support, finances, standard setting and control. If suppliers have limited capacity to innovate products and markets, they are likely to operate within captive or hierarchical global value chains (Gereffi *et al*. 2005: 87). Local knowledge mediation, diffusion and creation may be restrained, especially if exporting firms operate in enclaves such as export processing zones (Melese and Helmsing 2010).

Over the past decades, a number of local innovation systems in emerging economies have gained strength (Chaminade and Vang, 2008; OECD, 2005). These emerging local innovation systems increasingly enable firms to innovate products, processes and markets. This is necessary if firms want to operate in relational or modular value chains (Ernst and Kim 2002). A core role of emerging local innovation systems is to enable firms to acquire cutting-edge global knowledge and to enable local knowledge diffusion (Criscuolo and Narula, 2008). 'Technological gatekeepers' link global value chains to emerging innovation systems. This term describes firms with a relatively high level of absorptive

capacity, who acquire knowledge beyond their locality, which is subsequently diffused locally (Giuliani, 2011). Technological gatekeepers are often leading local value chains, linking global buyers to suppliers with lower levels of absorptive capacity at the bottom of global value chains (Chiaversio *et al.*, 2010: 334). Knowledge from global value chains diffuses down the value chain and spills over through observations, copying, labour market mobility, clustering and communities of practice (Belussi and Sedita, 2011; Giuliani, 2011). Trust and reciprocity become important, in order to ease reciprocal knowledge exchange. Non-firm actors can support knowledge diffusion with knowledge-intensive business development services, cluster support, elaborate appropriation regimes and applied research (Pietrobelli and Rabellotti, 2011).

Generally speaking, local innovation systems in emerging economies are at varying stages of emergence (Chaminade and Vang, 2008: 1688). Once local innovation systems are well-structured and efficient, they may stimulate both incremental and radical innovation based on local knowledge exchange (Pietrobelli and Rabellotti 2011: 1265). These local innovation systems enable competence building, knowledge diffusion and local knowledge creation. The capacity of firms slowly moves from primarily absorbing knowledge to creating knowledge in R&D, possibly in cooperation with universities and research institutes.

Absorptive capacity

Firms absorb and combine knowledge acquired from global value chains, local innovation systems and other sources. The combination of knowledge acquired from various sources with prior knowledge results in incremental innovations. Firms should have the ability to recognize the value of external knowledge, assimilate it, combine it with prior knowledge and exploit it to commercial ends (Cohen and Levinthal, 1990). As the amount of available knowledge on markets, products and production processes has increased manifold, if only due to Internet, the significance of absorptive capacity has increased over time.

Knowledge can be absorbed most easily if actors have a small knowledge gap and a comparable knowledge base. When the knowledge gap is too large, firms are unlikely to comprehend the significance of new technologies and to absorb it. However, when the knowledge base of two actors is too similar, there is not much to learn. Therefore, when the level of absorptive capacity of firms rises and the knowledge gaps disappear, firms may terminate existing knowledge networks and establish new ones (Buchmann and Pyka, 2013). In other words: a rise in absorptive capacity is likely to alter the local innovation systems and global value chains within which firms operate. It is the shared, but often uncoordinated, responsibility of value chain managers and actors within local innovation systems

to ensure that weaker actors benefit from capacitated firms within innovation systems.

Knowledge absorption takes place in four steps:

1) A firm first acquires knowledge, defined as the 'capability to identify and acquire externally generated knowledge that is critical to its operations' (Zahra and George, 2002: 189). It explores a large amount of knowledge from many knowledgeable sources in order to reduce uncertainty (MacPherson and Holt, 2007; March, 1991). However, knowledge that falls beyond a field's expertise tends to be overlooked (Cohen and Levinthal, 1990).
2) The firm subsequently assimilates knowledge, which requires 'routines and processes that allow it to analyse, synthesize, process, interpret and understand knowledge obtained from external sources' (Zahra and George, 2002: 189). Assimilation across staff and departments demands open, flexible and communicative structures within firms (Jansen *et al*., 2005).
3) The third step is transformation. This denotes the firm is able to change its routines by combining old and new knowledge. Out of its assimilated pool of knowledge, a firm filters knowledge in which it wants to invest and subsequently manages and finances the re-organization of its routines.
4) Finally the firm exploits knowledge commercially. It applies new technologies, produces new products and services and/or attracts new markets. The exploitation of knowledge benefits from capacitated and specialised departments and/or staff.

Co-relations

Many scholars study the effect of one or two of the above factors on innovation within the context of a given innovation system (see for instance: Brata 2009 and 2011; Chen, 2009; Choi et al., 2011; Cook, 2004; Eberhardt et al., 2011; Fabre, 2012; Fransen and Gaul, 2016; Kaufmann and Tödtling, 2001; Keller and Block, 2013; Nadvi, 1999). These studies study the impact of individual institutions and actors on innovation, but they do not study the systemic configurations of innovation systems, let alone co-relations between global value chains and local innovation systems.

The past two decades, scholars increasingly discuss how global value chains and local innovation systems co-relate (Altenburg *et al*., 2008; Asheim and Isaksen, 2002; Belussi and Sedita, 2011; Binz *et al*., 2014; Chaminade and Vang, 2008; Coe *et al*., 2004; Criscuolo and Narula, 2008; Ernst, 2002; Ernst and Kim, 2002; Fu *et al*., 2011; Giuliani, 2005 and 2011; Humphrey and Schmitz, 2002; Lundvall *et al*.,

2010; Pietrobelli and Rabbellotti, 2011; Sturgeon *et al*., 2008; Vang and Asheim, 2006). The firm is at the heart of their co-relation, because it absorbs knowledge from various sources and may creatively combine knowledge. The co-relations are expected to result in multilevel knowledge networks with varying network properties (Binz *et al*., 2014). These may range from weak innovation systems, to emerging innovation systems dependent on knowledge from outside the territory, to strong local innovation systems.

Weak innovation systems hardly exchange knowledge, and hence offer limited innovation opportunities for firms in emerging economies. Such weak local innovation systems are still quite common in emerging and developing economies and are described by various scholars (Ernst, 2002; Gebreeyeses and Mohnen, 2013; Parrilli, 2007).

Other innovation systems in emerging economies may depend on knowledge from global value chains. Especially suppliers operating in (quasi) hierarchical global value chains may overly depend on knowledge from global buyers. Such an innovation system may enable firms in emerging economies to innovate and learn about production processes and international standards, but is likely to impede product innovation (Ivarsson and Alvstam, 2010). The local innovation system primarily enables firms to produce within global value chains (Pietrobelli and Rabellotti, 2011). When firms start exporting, they may even downgrade by letting go of their product innovations. Such innovation systems have been described in developed and emerging economies (Asheim and Isaksen, 2002; Humphrey and Schmitz, 2002; Rabellotti, 2004).

Innovation systems in emerging economies may also enable firms to combine knowledge from global value chains and local innovation systems. This is most likely when global value chains are relational, local innovation systems are emerging and firms are able to absorb knowledge and to innovate products and processes (Pietrobelli and Rabellotti, 2011). In such innovation systems, technological gatekeepers may link global value chains to local innovation systems (Giuliani, 2007). Some territories with many modular suppliers may turn into specialised hubs within global value chains (Chaminade and Vang, 2008; Humphrey and Schmitz, 2002). Literature offers various case studies on radical innovation, but not many on incremental innovation (Chen, 2009; Cooke, 2004, 2005 and 2013; Gertler and Vinodrai, 2009; Giuliani, 2007; Tödtling *et al*., 2009).

Finally, the local innovation systems may also be strong, creating advanced local knowledge. Knowledge outside the territory is of limited relevance, as the territory is ahead of the game. Firms absorb cutting-edge knowledge from universities and other sources, and create new knowledge in R&D (Asheim and Isakson, 2002; Moodysson *et al*. 2008).

2.2.4 LESSONS LEARNED

The innovation system perspective, as originally developed by Lundvall at the national level, has greatly contributed to our understanding of innovation by analysing how systemic knowledge exchange within a bounded economic space impacts on innovation. Scholars have uncovered that innovation systems in emerging economies tend to differ from their counterparts in developed economies, in that firms are more likely to absorb knowledge from global value chains and local innovation systems. Their emerging innovation systems operate at multiple levels, whereby international, national and local institutions condition the firms' level of innovation. These innovation systems are not necessarily bounded by a bounded economic space in a geographical sense, but in a cognitive and institutional sense (Boschma, 2005). The multiple levels of the innovation system co-relate, whereby especially the co-relation between global value chains and local innovation systems has increasingly attracted attention from scholars.

However, the present state of the academic field leaves a number of questions and concerns unaddressed. Firstly, it remains unclear how firms absorb knowledge from global value chains and local innovation systems, as firms are often treated as black boxes. Chapter 4, which discusses the Yogyakarta case study, addresses this particular research question. Secondly, it remains a mystery why innovation systems differ across space and time, and how these differences can be analysed in comparative analyses. The reason is that many scholars use the innovation system perspective in a contextual manner, analysing how specific factors effect innovation within a given innovation system. Furthermore, scholars argue that territories do not only differ in the way that firms exchange knowledge, but also in their production systems. Such differences are also expected to influence innovation outcomes of firms (Amable, 2000; Crouch, 2005; Hall and Soskice, 2001; Schneider, 2009; Whitley, 2000). As a result, innovation differences of firms can be explained by differences in innovation and production systems. The innovation system perspective is thus underdetermined.

2.3 BUSINESS SYSTEMS

2.3.1 POSITION WITHIN INSTITUTIONAL ECONOMICS

The business system perspective includes both innovation and production systems (Amable, 2000). It is drawn from institutional economics, an academic domain that aims to understand the economic landscape based on the rules and actors on

which an economy depends and through which it is shaped (Martin, 2010). Institutional economics encompasses different ontological perspectives and epistemologies.

In the early days, institutional economists such as Hamilton, Veblen, Mitchell and Commons tended to study how enduring collective social forces shape the economy. Their perspective was both institutional and evolutionary, as is most evident in the work of Veblen and Hamilton. However, despite making important academic contributions the old institutional economists could not rival the rising neoclassical economics. Institutional economics, with its strong initial rejection towards equilibrium modelling, lost its foothold and formal modelling became the mainstream (Hodgson and Stoelhorst, 2014).

Williamson brought institutional economics back on the agenda, by coining the term 'new institutional economics'. However, he adopted a fundamentally different perspective, arguing that economies face transaction costs in order to overcome market imperfections. From his perspective, institutions reduce these transaction costs efficiently (Rafiqui, 2009; Williamson, 1995 and 2000). Innovation systems, for instance, would reduce the costs to exchange and absorb knowledge in the most efficient manner. Contrary to the 'old institutional economics', Williamson believed that transaction costs can be modelled. Adding transaction cost economics to neo-classical economic theory has improved the ability to model markets and their imperfections, which helps in better understanding why some regions perform well and others do not (Storper, 2005; Williamson, 1995; North, 1997).

New institutional economics has been criticised on two grounds. First, scholars argue that institutions are not necessarily leading to efficiency, but can also lead to suboptimal outcomes (Gomez, 2008; North, 1992 and 1997; Wood *et al*., 2006). Second, scholars note that new institutional economics focus in transaction costs at the expense of higher order institutions on the economy (Storper 2005'Williamson, 1995). In response to these criticisms, two other perspectives of institutional economics have emerged over the past decades: (1) Institutions-as-equilibria, where stable patterns of behaviour influence the economy; (2) institutions-as-rules, focusing on the rules that influence economic behaviour (Rafiqui 2009). The second approach combines old and new institutional economics.

The first approach studies firms´ routines, defined as the patterns of human action and relationships that persist and reproduce themselves over time, independent of the identity of biological individuals performing within them (Crouch, 2005: 10). Routines constrain the behaviour of people, resulting in continuity, fixity and predictability (Crouch, 2005). Because routines change only slowly, they become

carriers of history and keep information stable long enough for the selective forces of markets to operate (Essletzbichler, 2009). They also embody the cumulative and irreversible nature of knowledge development. Due to its tacit and cumulative nature, knowledge is actor-specific and difficult, if not impossible, to copy or imitate by other actors. (Boschma, 2009). Routines and knowledge tend to accumulate within a territory, leading to inter-firm and inter-regional variety. Scholars therefore study differences in routines among firms and territories. Comparative analysis between these units can then be related to differences in economic outcomes, such as innovation (Boschma and Frenken, 2006). Assuming that institutions create temporary equilibria, multiple equilibrium modelling can be applied (Witt and Redding, 2013).

The second perspective considers institutions as the rules of the game. Formal rules comprise the regulations and laws, and informal rules constitute the norms and values that stimulate or restrict human behaviour (Hodgson, 2006 and 2009). They range from regulations backed by the force of law or organizational procedure, to more informal practices that have a conventional character (Hall and Thelen, 2009). Rules condition the behaviour of firms and people and create distinct innovation and production opportunities (Allen and Aldred, 2009; Crouch *et al*., 2009). As firms are likely to be aware of these opportunities, they will, on the whole, adjust their way of working (Carney *et al*., 2009) and competences (Allen and Aldred, 2009) to take advantage of these opportunities. A selection process takes place through market competition (Glückler, 2007), whereby firms that have adjusted are more likely to survive (Carney *et al*., 2009). Similarities across firms' routines and competences are subsequently expected to result in comparable innovation outcomes.

I adopt the perspective of 'institutions-as-rules', whereby rules guide the firms' behaviour. Rules can be separated higher-order rules, which set the scene, and specific rules developed by the actors engaged in the local industrial sector (Martin, 2010). I also separate institutions from routines, which are perceived as their outcomes. This approach is common in evolutionary economics (Rafiqui, 2009). Within this perspective, I focus on business systems, because they are assumed to create distinct innovation opportunities (Carney *et al*., 2009; Hall and Soskice, 2001; Hodgson, 2009; Whitley, 1992). My perspective differs from neoclassical economics, in that economic behaviour is moulded by institutions, and not just by profit maximisation. It also differs from new institutional economics, in that business systems are not necessarily reducing transaction costs.

2.3.2 NATIONAL BUSINESS SYSTEMS

Business systems are often studied at the national level, where they are expected to bind institutions with similar features together (Crouch, 2005; Geels, 2004), which creates coherence (Amable, 2000) and increased returns (Hall and Soskice, 2001: 17). They comprise the fundamental ground rules and the players of the innovation game, thus conditioning the innovation outcomes (Hall and Soskice, 2001; Howell, 2003). The five interdependent elements are: the financial system; corporate governance (the internal structure of the firm); the pattern of industrial relations; the education and training system; and the preferred mode for the transfer of innovations within the economy (Nölke and Vliegenthart, 2009). Institutional complementarities appear when 'the presence of one institution increased the returns of other' (Hall & Soskice, 2001, p. 17).

In their seminal work, Hall and Soskice (2001) identify two business systems at opposite poles of a continuum: liberal and coordinated market-economies. The two systems are expected to stimulate radical and incremental innovation respectively. In liberal market-economies, the economy is characterized by the arm's-length exchange of goods or services within a context of competition and formal contracting (Hall and Soskice, 2001: 8). Firms do not share innovation risks and knowledge outside the market environment. Instead of sharing production and knowledge, they employ skilled human resources and purchase technologies in order to produce and innovate in-house. Market signals stimulate internal innovation processes. Within this context, SMEs are likely to shy away from the risks associated with innovation, resulting in risk-averse firm-level strategies, geared toward mass production with low levels of innovation (Nölke and Vliegenthart, 2009). By contrast, large firms may control local value chains in oligopolistic markets and produce radical ´out-of-the-box´ innovations (Boschma and Frenken, 2015).

Firms in coordinated market economies "depend more heavily on non-market relationships to coordinate their endeavours with other actors and to construct their core competencies" (Hall and Soskice, 2001: 8). Non-market relationships include knowledge exchange among firms and non-firm actors, and among managers and staff within firms. By doing so, the government and intermediary organisations share innovation risks. Joint activities of firms and non-firm actors enable actors to learn from each other and to build on each other's knowledge. This is more likely to result in incremental innovations, whereby existing knowledge is absorbed and combined in new ways (Allen and Aldred, 2009; Hall and Soskice, 2001).

The work of Hall and Soskice (2001) is widely applauded, but also heavily criticised. Critics note that the role of the government is underrepresented and

that the model is only operationalised at the national level. If the model would assume open economies and/or include different roles of the government, a greater variety of institutional regimes would be identified (see for instance Allen and Alfred, 2009; Griffiths and Zammuto, 2005; Haake, 2002; Nölke and Vliegenthart, 2009; Schneider, 2009; Schneider and Paunescu, 2012; Whitley, 2000; Witt and Redding, 2013; Wood and Frynas, 2006; Wood *et al*., 2011).

Various scholars have included the role of the government in the analysis of institutional regimes. Especially within the political economy tradition, the involvement of the government is perceived to be a key factor explaining innovation (Griffiths and Zammuto, 2005: 826). The role of the government can range from liberal or weak to coordinating or strong (Griffiths and Zammuto, 2005). A liberal government sets rules enabling the market to function properly, including rules on registration, property rights, labour and industrial standards, and bankruptcy (Chang, 2002; Crouch, 2005). Otherwise the role of the government and intermediary organisations is limited to basic support services, including education, training, business development services and finance (Lundvall et al., 2010). By contrast, the role of a coordinating government is no longer limited to rule setting and basic services, but extends to pro-actively stimulating knowledge creation, exchange and diffusion (Crouch, 2005). Whitley (1992 and 2000) details what different business systems may arise depending on different roles of the government.

The second criticism is that the perspective is developed at the *national* level. This approach faces two shortcomings. First, it does not do justice to the impact of the *international* economy on emerging economies, given that an ever-increasing number of firms network both locally and globally (Coe *et al*., 2004; Dicken *et al*., 2001; Ernst, 2002; Ernst and Kim, 2002; Henderson *et al*., 2002; Humphrey and Schmitz, 2002; Lane, 2008; Scott and Storper, 2007; Schneider, 2009). Local economies are impacted by international standards and global value chains. International standards are set on labour conditions, safety, health, product standards and so on. They can be generic, such as ISO 9000, or specific to a sector and region, and they can be established, monitored and implemented by a wide variety of actors. They impact on innovation, because they set entry barriers for exports and their regular adjustments over time necessitate innovation of suppliers (Nadvi and Waltring, 2004). It is close to impossible for SMEs to adhere to international standards and find clients in far-way markets on their own. They therefore often opt to operate in global value chains (as discussed in section 2.3.1).

At the same time, business systems are *localised*, a process which is accentuated by decentralisation policies and by sectoral specialisation within territories (Allen and Alfred, 2009; Crouch *et al*., 2009; Whitley, 1992; Witt and Redding, 2013). The

institutional regime of, say, the ICT industry in Shanghai, is likely to differ from the institutional environment in the horticultural sector in a poor rural area in Xinjiang, Western China. Increasingly, institutional comparative advantages are embedded in enduring local, national and international networks, specific to sectors (Scott and Storper, 2007). This demands a more fine-grained analysis, which is sensitive to local, national and international sectoral specificities (Schneider and Paunescu, 2012).

2.3.3 MULTI-SPATIAL BUSINESS SYSTEMS

As discussed, above, the innovation of firms is conditioned by a business system operating at multiple spatial levels. At the international level, standards set by international buyers and trade regulations condition innovation strategies of suppliers and traders in emerging economies. Nationally, industrial and innovation policies, as well as labour relations, education and training regimes, financial regimes and networks condition their innovation strategies and competences as well, as they create specific innovation opportunities and constraints. Local policies, programmes and networks may create highly localised innovation opportunities. All these different spatial levels influence what competences firms take in-house or buy in, and what innovation strategies they follow. Dicken *et al.* (2001) therefore argue for a multi-spatial perspective.

While many scholars limit their study to the national level, a growing body of literature has sought to establish how institutions and actors co-relate across spatial levels. This section discusses key lessons learned on the co-relations between national business systems on the one hand and the international economy, local business system, and firm strategies and competences on the other.

A growing body of scholars study how national business systems relate to the international economy (Coe *et al.*, 2004; Henderson, 2004; Henderson *et al*., 2002; Lane, 2008; 2011; Nölke and Vliegenthart, 2009; Parrilli *et al.,* 2013; Pietrobelli and Rabellotti, 2011; Sánchez-Ancochea, 2009; Schneider, 2009). The main line of reasoning is that the strategies of multinationals and global buyers are likely to be strategically coupled to national business systems (Coe *et al.*, 2004; Henderson *et al*., 2002). For instance, if global buyers aim to mass produce crafts at low costs, they are likely to search for firms in territories where firms are conditioned to produce at low costs and innovate production processes (in order to further cost reductions). At the same time, local firms are also likely to actively look for global buyers interested in mass production. This type of strategic coupling is likely to lead to a *dependent economy*, where firms depend on orders and knowledge of global buyers, while the national business system is either weak or liberal

(including, among others, weak innovation policies, labour relations, trade unions, financial institutions, business associations, and trust among economic actors). The territory benefits from investments, orders and/or knowledge from global buyers and capacitated local firms and in turn global buyers benefit from relatively low labour costs and tax breaks. Especially if global value chains are captive, suppliers are likely to innovate production processes in order to reduce production costs and hence remain competitive (Gereffi *et al.*, 2005). Dependent economies are found in various countries in Eastern Europe, Latin America and Asia (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009).

By contrast, if global buyers look for innovative handicrafts and costs are of secondary importance, they are likely to consider firms in territories where the business system enables firms to innovate products. These territories are likely to have strong or coordinated business systems, with effective economic policies, functioning trade unions, collective bargaining, a developed financial sector, trust among actors, etcetera (see also Pietrobelli and Rabellotti, 2011).

However, strategies of global buyers and business systems may often strategically be joined, but not always (Lane, 2008). Conflicts may arise for two reasons. The first reason is that the international economy is volatile, while business systems are likely to change slowly. Global buyers may, at a relatively short notice, change their strategies in order to cope with economic volatility. However, due to sunk costs, institutional rigidity, accumulated knowledge and vested interests (Boschma and Frenken, 2007; Essletzbichler and Rigby, 2007), they may opt to continue working with the same suppliers and/or traders, at least for a period of time. The second reason is that the government, intermediary organisation or the firm itself may introduce innovation policies, while global buyers may want to retain innovation themselves (or the opposite). Strategies of global buyers and suppliers and incentives offered by business systems may therefore diverge, potentially creating ambiguity and inconsistency. As a result, the innovation incentives of the multilevel business system become blurred.

Other scholars have studied the co-relations of national and local institutions (Crouch et al., 2009; Griffiths and Zammuto, 2005; Saliola and Zangfei, 2009; Vang and Asheim, 2006; Wood and Frynas, 2006; Witt and Redding, 2013). The studies highlight a considerable variety and unevenness between territories and sectors within national business systems, sometimes referred to as variegated capitalism (Essletzbichler, 2009; MacKinnon *et al.*, 2009). Business systems may even be segmented. Pedersen and McCormick (1999) and Wood and Frynas (2006), for instance, argue that multinational firms, indigenous formal firms and indigenous informal firms operate in different, segmented business systems in various African countries and Witt and Redding (2013) argue that China houses separate business

systems for multinationals, cooperatives and private firms. However, variety can also occur when a country houses only one business system. For example, Strambach (2008) and Strambach and Storz (2008) show that a group of German firms is able to flexibly apply and adjust the rules of the business system and hence become more innovative than would be expected. They argue that the business system has plasticity, which enables local variety. These studies therefore illustrate the need to study business systems at the local level.

The link between business systems and the strategies and competences of firms is hotly debated as well. Various scholars argue theoretically and empirically that business systems condition the firms´ strategies and competences (see for instance Hall and Soskice, 2001). On the other hand, Boschma and Frenken (2006) argue that there is too much variety within business systems to model the firms' behaviour and innovation outcomes. My position lies in the middle: the business system is likely to condition the firms' behaviour, but firms have agency, whereby an individual can act on behalf of an actor and does not necessarily follow rules blindly (Hewson, 2010). The behaviour of firms is, in my perspective, not just driven by institutions (which would be a form of institutional determinism), neither is it fully driven by markets, but by a combination of the two (Christiansen and Jakobsen, 2012). Firms may, to the extent that bounded rationality allows, position themselves within the business and innovation system in such a way that they maximise profits and satisfy social norms, values and formal rules. They may become imitators, pioneers, designers, innovators, or they may combine strategies (Lundvall *et al*., 2002). If a business system is ambiguous and/or inconsistent, firms experience social norms, values and rules becoming unclear, and they may therefore opportunistically strive for short-term profit instead, or they may aim at altering their business and innovation system (Geels, 2004; Rafiqui, 2009). Any modelling of innovation outcomes should therefore allow for variation and should assess to what extent a multilevel business system is coherent or not.

2.3.4 NESTED BUSINESS SYSTEMS

Business systems are not only multilevel in a spatial sense, but also contain institutional layers. As business systems comprise a multitude of institutions and actors, scholars structure them in vertically nested institutions, whereby higher level institutions set the playing field for lower level institutions (Amable, 2000; Helmsing, 2013; Rafiqui, 2009; Williamson, 2000). The way of structuring depends on the objective of the study. Williamson (2000), for instance, aims at identifying the endurance of institutions and groups them into four layers: (1) Informal rules, such as norms and values that steer trust among actors are considered to be highly enduring; (2) High level formal rules, such as constitutions and human rights, also

change slowly, albeit faster than informal rules; (3) Governance rules, defined as the cooperation among actors, can change in a medium long period of time. They include property rights, rules governing firm ownership and standards of global buyers. (4) Transaction contracts, which describe the exchange of goods and knowledge, change frequently.

To my knowledge, none of the nested institutions discussed in literature links the perspective of business systems to that of innovation systems. However, Geels (2004) and Geels and Schot (2007) have developed a multilevel perspective of radical innovation, which moves into this direction. As the approach adopts an institutions-as-routines perspective and focuses on radical innovation, it comes from another strand of literature and cannot be easily incorporated. The scholars describe three institutional layers: socio-technical landscapes, socio-technical regimes and technological niches. The socio-technical landscape describes the environment outside the scope of knowledge actors. It includes macro-economic policies and norms and values. The socio technical regime describes the institutions governing the sector, as well as the specific knowledge complexity, appropriation and accumulation (based on Nelson, 1994). It holds that actors have certain routines, which are sector and territory specific. Technological niches describe the interactions among a few actors at the micro-level where firms radically innovate. These niches act as 'incubation rooms', protecting the actors against market forces. In the words of Strambach (2008), the technological niches use the plasticity of institutions to create a more innovative micro environment among a small group of actors.

2.3.5 LESSONS LEARNED

The perspective of business systems enables a comparison of innovation outcomes between countries and between segments of a business system. It highlights that both production and innovation systems impact on innovation. However, the application of this perspective to a study of craft exporters in three territories faces three challenges.

Firstly, the business system perspective tends to focus on the national level. Recently, scholars have assessed how the international economy and national business systems jointly effect innovation outcomes, but this field of study is still emerging (Nölke and Vliegenthart, Sánchez-Ancochea, 2009; Schneider, 2009). Other scholars have considered variation within national business systems, but this perspective is still mainly descriptive (Coe *et al.*, 2004; Lane, 2008; Henderson, 2004; Henderson *et al*., 2002; Lane, 2008; 2011; Parrilli *et al.,* 2013; Pietrobelli and Rabellotti). Only a few scholars have moved to the analysis of multilevel business

systems, but they focus solely on so-called dependent economies (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009).

A second challenge is that business systems condition the behaviour of firms and their innovation outcomes, but because firms have agency their behaviour cannot fully be modelled (Boschma and Frenken, 2006; Hewson, 2010). The perspective is underdetermined and analytical models should always allow for variety within.

Thirdly, the way that multilevel business systems structure institutions is not fully worked out, despite useful nested models (Amable, 2000; Geels, 2004; Geels and Schot, 2007; Helmsing, 2013; Rafiqui, 2009; Williamson, 2000). It remains unclear how the networks at local, national and international level, and the institutions that condition them, jointly condition innovation outcomes of firms.

2.4 PATH DEPENDENCE AND RENEWAL

2.4.1 POSITION WITHIN EVOLUTIONARY ECONOMICS

The concepts of institutional path dependence and renewal are drawn from evolutionary economics, which aims to explain economic development based on space-specific historical processes (Dosi and Marengo, 2007). It holds that the future of the economy is not shaped by the invisible hand of markets, but by long term innovation processes. The historical process does not automatically lead to the most efficient institutional regime, but this depends on the dynamics of all aspects within the business system (Dosi *et al* 2005). Any evolutionary system is characterized by the principles of selection, path dependence and variation (Essletzbichler and Rigby 2007). Selection of firms takes place through market competition. Path dependence focuses on those cumulative structural mechanisms that cause new ties to reproduce and reinforce an existing network structure. By contrast, variation enables novelty and path-disruption (Glückler, 2007).

Evolutionary perspectives have received remarkably little attention in the innovation system literature to date (Boschma and Frenken, 2015). In the late 1800s and early 1900s, evolutionary perspectives were part and parcel of the institutional economic approach of Veblen, Hamilton and Marshall (Nelson and Nelson, 2002). Schumpeter subsequently introduced evolutionary economics proper, with a focus on processes of creative destruction and innovation. However, evolutionary economics quickly lost its appeal. Schumpeter wrote in 1934: 'The evolutionary idea is now discredited in our field' (Hodgson and Stoelhorst, 2014: 517). Nelson and Winter (1982) placed evolutionary economics on the agenda

again, when they published their book '*An evolutionary theory of economic change*'. This was followed by a rush of publications, resulting in a plethora of self-declared approaches (Boschma and Frenken, 2007; Essletzbichler and Rigby, 2007; Martin and Sunley, 2006). These approaches can be grouped into three strands (MacKinnon, 2008).

The first strand studies technical change, innovation and knowledge (Dosi, 1997; Dosi *et al*., 2006; Dosi and Marengo, 2007; Dosi and Grazzi, 2010). It is neo-Schumpeterian in terms of its conception of the economy as a turbulent system driven by waves of innovation (MacKinnon, 2008). As my study has a different focus, this strand is not explored.

The second strand, as introduced by Nelson and Winter (1982), analyses evolution based on organizational routines that are built up over time, providing the basis for competition between firms. Routines limit the endless number of choices that a market offers, without assuming profit maximisation and perfect competition (Nelson and Nelson, 2002). The behaviour of firms is perceived as stemming from their routines, rather than from territorial institutions. The assumption is that firms develop routines in a path-dependent and idiosyncratic manner, which makes routines of firms vary greatly, even under the same institutions (Boschma and Frenken, 2011). This strand is also not explored.

The third strand studies evolution from the perspective of path dependence. This strand is strongly influenced by institutional economics, as institutions are perceived as creating a lock-in (Amin, 1999). The history of business systems shapes institutional comparative advantages, enabling territories to respond to the pressures of globalization (MacKinnon, 2008). Economies can be locked into inferior trajectories even though more efficient alternatives are possible as well (Martin and Sunley, 2006).

I approach the evolution of innovation of craft exporters in emerging economies from the perspective of the path dependence of business and innovation systems. These are known to change slowly over time, whereby their evolutionary pattern depends on present and previous institutions. They provide stability and predictability. At the same time, they incrementally adapt to and incorporate agency, innovations, new actors and new markets (Martin and Sunley, 2006). Scholars indeed find a remarkable stability in innovation systems over time: international empirical comparisons that use indicators like R&D and patents underline the relative stability of innovation profiles of national economies (Strambach and Storz, 2008).

Despite the academic focus on path dependence and stability, scholars have also reported on path renewal and creation. For instance, the apparel sector in South

East Asia has transformed from the assembly of imported goods, to process innovation, to the innovation of products, processes and markets (Gereffi, 1999). In China, regime change resulted in a radical transformation of the institutional environment and arrangement in the 1980s (Zhang and Whitley, 2013). Private contracting was spontaneously restored in villages, which resulted in a restored exchange of products and knowledge among firms and local clients (Aoki, 2013). Economic transformation may be especially rapid and volatile in emerging economies, but Schneider and Paunescu (2012) also report a remarkable change of business systems in Europe: over the past decade many countries have changed the way business has been run and coordinated. This radical change is discussed in sections 2.4.3 and 2.4.4.

2.4.2 INSTITUTIONAL PATH DEPENDENCE

Business and innovation systems of mature industries are expected to be path dependent, which entails that their outcomes evolve as a consequence of their own history (Martin and Sunley, 2006; MacKinnon, 2008). Martin and Sunley (2006) identify two types of path dependence: institutional and technological. The core argument of institutional path dependence is that institutions change slowly and hence provide stability and predictability by guiding perceptions and actions (Dosi *et al*., 2005; Geels, 2004; Rafiqui, 2009; Martin and Sunley, 2006). Sunk capital investments, contractual relationships, organisational strategies and the accumulated knowledge base of firms generate institutional hysteresis (Essletzbichler and Rigby, 2007). Agglomeration externalities arise, which result in increasing return effects: firms that best use these externalities are most likely to have high returns. But agglomeration economies also create a lock-in, which is not easily disrupted (Martin, 2010; Boschma and Frenken, 2007). Sunk capital invested in interrelated technologies gives innovation systems a certain 'hardness', which makes it even more difficult to change mature industries (Geels, 2004). Regions may subsequently become unresponsive to change due to vested interests, institutional rigidities and sunk costs (Boschma and Frenken, 2006).

By contrast, technological path dependence is caused by technological decisions, which may be ad-hoc but are equally irreversible. The most famous example is the QWERTY keyboard. The QWERTY keyboard was invented by Christopher Latham Sholes in 1875 (www.ideafinder.com/ history/inventions/qwerty.htmdecision), an invention that has proven to be irreversible and not necessarily the most efficient. This study focuses on institutional path dependence, as institutions play a strong role in mature sectors such as handicrafts. By contrast, technological decisions are likely to have less sectoral relevance.

In the past decade, the notion of institutional path dependence as a stable state of equilibrium has given way to the notion of incremental change (Martin, 2010). Change is likely to be incremental, as large transformations would lead to many losers and hence more opposition (North, 1992). Business and innovation systems are expected to follow a historical path, whereby early decisions and outcomes matter more, as their irreversibility sets conditions for later decisions and outcomes (Martin, 2012). The business and innovation systems have proven to be able to adapt to internal and external changes, such as changes in relative prices, new technologies and new actors, without altering radically (Strambach and Storz, 2008). Institutions appear to have a degree of 'plasticity' (Strambach, 2008), which refers to the continuity of incremental change without necessarily breaking out of existing paths (Notteboom *et al.,* 2013). Actors reinterpret the rules over time (Hall and Thelen, 2009). Institutions therefore co-evolve incrementally with and adapt to changes in actors, technologies and markets (Nelson, 1994; Aoki, 2013). Institutions may also be adjusted by recombining elements, called 'institutional bricolage' (Carney *et al*., 2009). These transformations of one institution, or a few, do not necessarily destabilise the coherence of the whole innovation system. This enables institutional variations, the attachment of new elements to existing institutions and the change of individual institutions within an institutional regime (Strambach, 2008).

This adaptive ability of business and innovation systems gives rise to irreversible, slow and predictable development trajectories (MacKinnon, 2008). This is not the same as historical determinism, since business and innovation systems may at any time follow a range of possible development trajectories within the confines of their present and past (Martin and Sunley, 2006). Neither do business and innovation systems necessarily become more efficient over time: evolution does not necessarily maximise efficiency, but instead reflects the effects of shocks and agency on institutions (Boschma and Frenken, 2006; Dosi *et al*, 2005).

2.4.3 WINDOWS OF LOCATIONAL OPPORTUNITY

A quick look at history reveals that occasionally new development paths emerge, while older development paths may be disrupted. When a new technology emerges, such as the railway, automobiles, the computer and the Internet, a 'window of locational opportunity' is temporarily opened. These new technologies have a long-term, irreversible and radical effect on economies (Martin, 2010). Industrialisation of new technologies is expected to take place within a 'virgin' institutional environment and arrangement. Institutions still have to be developed around a new technology, as new technologies demand new academic disciplines, new IPR rules, new labour pools, etcetera (Nelson, 1994; Boschma and Frenken,

2006; Scott and Storper, 2007). The spatial distribution of institutions is therefore unlikely to explain where new industries grow and develop (Boschma and Frenken, 2009). A new sector with a new institutional environment and arrangement emerges. If the firm strategies and competences are successful within a territory, spinoff firms and labour mobility lead to their replication. Routines and institutions are then likely to branch out to other territories and related industries (Boschma and Frenken, 2011).

Over time, however, the windows of locational opportunity are expected to close again (Notteboom *et al.*, 2013). The institutional environment and arrangements are developed and the industry matures. It is assumed that first mover advantages become hysteretic rigidities that prevent adaptation to new innovations, sectors and products (Lambooy and Boschma, 2001). Core competences of firms become core rigidities (Kaplinsky and Morris, 2001) and institutions start obstructing new development paths (Boschma, 2009). The situation remains in an equilibrium, until a shock happens or the industry fails (Martin, 2010). In mature industries, such as handicrafts, vested interests, rigidities of institutions and sunk costs are therefore expected to result in inertia, with a slow decline in innovation (Boschma and Frenken, 2006). Redundant institutions may slow down adaptive processes, resulting in failing regions (Essletzbichler and Rigby, 2007). Such an outcome would render the industry highly prone to shifts in markets or the rise of competitors elsewhere, and to deterioration or even decline (Martin, 2010).

The "windows of locational opportunity" approach is not very useful in explaining path renewal in mature industries in emerging economies, since mature industries are institutionally embedded. In fact, institutions are perceived to constrain change (Boschma and Frenken, 2009; Essletzbichler and Rigby, 2007; MacKinnon, 2008). The assumption that new industries settle in 'virgin' institutional environments and arrangements is not satisfactory either (Martin, 2010), because locational choices are likely to be influenced by generic institutions, such as property laws and educational systems and these differ across space. The strategic action of actors may also shape or constrain the opening of windows of opportunity (Notteboom *et al.*, 2013; Martin and Sunley, 2006).

2.4.4 PATH RENEWAL

Can mature industries, such as handicrafts, renew their development path, despite vested interests, institutional rigidities and sunk costs? The evolution of industries is expected to take place in 'punctuated equilibria', in which periods of incremental change alternate with major shocks that shift business and innovation systems to new configurations (Boschma and Frenken, 2007; Crough 2005; Martin and

Sunley, 2006). Drahokoupil, in Martin (2012) adds the option of 'punctuated evolution', signalling that periods of incremental change are evolving instead of in state of equilibria. Path renewal can be triggered by external shocks, including a change in relative prices (North 1992) and the exhaustion of sources of supply (MacKinnon, 2008). Path renewal can also be triggered by internal factors. On the one hand, policy reform and collective action may intentionally trigger institutional change (Hall and Thelen, 2009; Kingston and Caballero, 2009). On the other hand, the uncoordinated actions of many actors may unintentionally trigger change. As a result of the interplay of intended and unintended action of many actors and shocks, new institutions may emerge, while old institutions may remain as they are, may close down, or may adapt. As some institutions change or emerge, the business and innovation systems as a whole incrementally change as well. Since change is not uniform across space, some territories and sectors may change at a faster pace than others and/or may move in somewhat different directions. Heterogeneity thus slowly seeps into the business and innovation system. It builds up, until a tipping point is reached and the development path renews or destructs itself (Crough, 2009; Hall and Thelen, 2009; Martin and Sunley, 2006). Then, apparently suddenly, firms perceive another incentive scheme and are likely to adjust their strategies and competences accordingly. The process leading to path renewal is therefore incremental, even if the resulting configurational change is radical.

Institutional path dependence, renewal and destruction are inherent elements of evolutionary processes. Institutional regimes are not 'pure' or 'settled', but contain structured heterogeneity and ambiguities (Crouch *et al*., 2009; Martin and Sunley, 2006). As institutional regimes comprise many institutions and actors, heterogeneity is the norm. Furthermore, rules do not always function as anticipated but may have side-effects as well, which creates ambiguity (Hall and Thelen, 2009). Institutional regimes comprise multiple subsystems, such as the financial and educational subsystem, which are governed by multiple and at times conflicting rules. Actors may bridge and broker across the boundaries of these subsystems (Kaufmann and Tödtling, 2001). Business development support programmes may span these boundaries, if they integrate policy instruments across these subsystems (Keller and Block, 2013). Firms tend to span boundaries, as they operate in markets, take up positions in global value chains, may work with a local university in its R&D etcetera. These boundary spanners are confronted with conflicting rules, which they reinterpret, combine, or ignore. This slowly changes the rules of the game. Successful local institutions may subsequently climb the institutional ladder and 'like lava, have the tendency to spread out and then solidify to become part of the institutional framework' (Brouseau and Raynard 2007 in Hall and Thelen 2009). When heterogeneity subsequently rises above a

threshold, it results in path renewal or destruction (Crouch, 2005; Schneider and Paunescu, 2012).

Path renewal is eased by flexible, weak and heterogeneous institutions (Witt and Redding, 2013), as well as by low sunk costs in low-tech industries, such as handicrafts. Decentralisation and privatisation are likely to increase chances of path renewal as well, since growing regional differences lead to heterogeneity, experimentation and ambiguity within business systems (Bennet 1990; MacKinnon, 2008). Path renewal implies a struggle between rivalling actors, as those who benefit from the present incentive structure are likely to oppose change (MacKinnon, 2008; Helmsing, 2013; Carney *et al*., 2009; North, 1992). Therefore, the weaker the actors in control, the easier path renewal is.

Overall, I identify five instruments of path renewal:

1. *Paradigm shifts in institutions* may arise due to a radical change in policies, or a break of trust among actors (North, 1992 and 1997; Williamson, 1995). They include institutional reform that is explicitly mandated or endorsed by government and the unintended actions of multiple actors (Hall and Thelen, 2009; Kingston and Cabelleri, 2009). Gereffi (2014) reports on paradigm shifts as a result of mainly unintended actions across global value chains.

2. *New markets* call for new institutions and may result in growing institutional heterogeneity (Martin and Sunley, 2006) and increased opportunities for learning and upgrading (Gereffi, 1999; MacKinnon, 2008). Especially domestic markets in emerging economies may offer an opportunity for innovation in different institutional environments, away from export markets dominated by lead firms of global value chains (Altenburg *et al*., 2008; Gereffi, 2014).

3. *Agency of non-firm actors* (Rafiqui, 2009). Existing non-firm actors may deviate from the existing path (MacKinnon, 2008), while new actors may open up new development paths (Martin and Sunley, 2006). Even small non-firm actors may function as a catalyst of cross-cutting institutional change, as has been studied for a small government innovation programme in the USA (Keller and Block, 2013). Examples of actors that have managed to alter innovation systems are Barcelona Activa, Cape Town Public Private Partnership and Bolbao Metropol-30 (Clerk *et al*., 2010). However, their agency coincided with a paradigm shift in formal institutions.

4. *Agency of firms* (Boschma and Frenken, 2011). Firms are at the core of evolutionary systems (Essletzbichler, 2009). As firms aim to enlarge their

market share, they may put pressure on existing institutions (Hall and Thelen, 2009). As 'boundary-spanners', firms are likely to recombine or reinterpret institutions (Crouch *et al*., 2009; Martin and Sunley, 2006; Strambach and Storz, 2008). They may set up business associations in order to fill institutional gaps (Crouch, 2009). Firms may also change institutions through labour conflict (MacKinnon, 2008) and by diversifying production to new markets (Martin and Sunley, 2006). Finally, new firms may bring in new competences, knowledge and networks (Carlsson *et al.*, 2009; Sternberg, 2007).

5. *Radical innovation* may open up a window of locational opportunity, whereby new industries and institutions emerge. New technologies may also be absorbed from elsewhere (Boschma and Frenken, 2006; Nelson, 2004).

2.4.5 LESSONS LEARNED

Business and innovation systems can be perceived as institutionally path-dependent systems: they can be understood based on their own history (Dosi and Marengo, 2007). Their evolution is irreversible and cannot be relocated to or reproduced within another territory, nor can they be understood without appreciating the initial situation and historical path of a territory. Furthermore, they change incrementally. The main lesson learned is, therefore, that the institutions impacting on innovation do not only describe the way the game is played, but are part of the game as they themselves change in path-dependent patterns as well.

A second lesson learned is that periods of relative stability are likely to be intertwined with periods of path renewal and/or destruction. Institutional regimes are inherently heterogeneous. This may reach a tipping point, due to the culmination of external shocks, changes in markets, the slow pace of institutional change, the ambiguity of institutions, and/or the struggle between actors. Once the tipping point has been reached, institutions change their configuration and firms perceive radically different incentives. Due to the large number of factors that may impact on path renewal, its timing is unexpected and unpredictable. Such changes do not happen easily in mature industries, such as handicrafts, as they have to overcome vested interests, institutional rigidity and sunk costs. These can be overcome more easily, however, if institutions and actors are weak and the sunk costs are low, as in low-tech sectors. As a result, mature industries are not only likely to be path dependent and destructive, but may equally include outbursts of path renewal.

A third lesson learned is that institutional path dependence is not a perspective that stands on its own, but can be embedded in other perspectives, such as those of innovation and business systems (Martin, 2012). It can be treated as a punctuated equilibria, enabling formal equilibrium modelling, or it can be treated as a punctuated evolution, which requires other types of models.

2.5 COMBINING THE PERSPECTIVES

2.5.1 CONCLUSIONS FROM THE PERSPECTIVES

The above sections have shown that each of the perspectives described have merit, but each is descriptive in nature and underdetermined. Each perspective also answers a somewhat different research question. In summary, the perspective of innovation systems enables an analysis of innovation differences *within* a territory, using the innovation system perspective contextually, and it describes different network entities of innovation systems (Binz *et al.*, 2014). The business system perspective enables an analysis of innovation differences *between countries*, while it has to be adapted in order to assess innovation of craft exporters operating in local, national and international networks. That demands a multilevel analysis instead. Institutional path dependence enables a dynamic analysis, but it cannot stand on its own. This section attempts to converge these three perspective into one.

A convergence of institutional and evolutionary economic perspectives, the academic domains within which respectively business/ innovation systems and institutional path dependence fall, is widely debated (see for instance the special edition of *Economic Geography 85(2)* in 2009*)*. Considering the many perspectives adopted by scholars, it is understandable that some scholars are critical of such a convergence. Scholars of 'new institutional economics' and 'institutions-as-routines' point out that firm strategies and competences vary greatly within one institutional regime. An institutional evolutionary perspective is therefore perceived to face major challenges in formal modelling (Boschma and Frenken, 2011). By contrast, other scholars welcome a convergence of the two perspectives because they share the same ground rules: both reject utility-maximisation behaviour of people, both stress bounded rationality, information asymmetry and opportunism, and both attach importance to knowledge accumulation and learning (Hodgson and Stoelhorst, 2014; Nelson and Nelson, 2002). Scholars of technological change already converge the two perspectives and an increasing number of scholars merge institutions-as-rules and path dependence as well

(Morgan, 2016). Martin (2000:76) even argues that 'the form and evolution of the economic landscape cannot be fully understood without giving due attention to the various social institutions on which an economy depends and through which it is shaped'. He and others express the need to include a deeper institutional analysis into evolutionary perspectives, because institutional regimes are higher-order processes that are related to and co-evolve with micro processes within territories (Carney *et al*., 2009; Essletzbichler, 2009).

What would a perspective that combines business systems, innovation systems and institutional path dependence look like? Five conclusions can be derived from the literature review presented in the previous sections:

1. The combined perspective would be multilevel (Essletzbichler, 2009). Higher-order institutional subsystems are expected to condition lower-order subsystems. I propose the following subsystems: business systems as the highest level subsystem, followed by innovation systems and finally firms' competences and strategies.

2. The perspective would be multi-spatial, because the firms' level of innovation is influenced by international, national and local institutions and actors.

3. Institutions condition rather than determine innovation outcomes (Boschma and Frenken, 2011). Agency, a profit-orientation and off-path experimentation take place within and around the confines of historically shaped institutions (Martin, 2010; Rafiqui, 2009). Business and innovation systems therefore allow for variety (Martin, 2010).

4. Institutions change in irreversible, incremental historical paths, due to institutional path dependence (Essletzbichler and Rigby, 2007; Hall and Thelen, 2009; Strambach and Storz, 2008). Their evolutionary processes are known to be non-linear, as institutions have two contradicting qualities: on the one hand, they co-relate with other institutions within coherent and nested innovation systems. On the other hand, they are inherently heterogeneous and ambiguous. They aim for coherence, but are constantly pulled away from a stable state. As a result, innovation outcomes can be explained based on their history, which are predictable in the short to medium term due to the institutional path dependence of business and innovation systems, but the analysis has to be treated with care due to non-linearity.

5. Path-dependent, incremental change is intertwined with periods of path destruction and/or renewal. Evolution can be treated as multi equilibria

processes, which function as a proxy of a reality of constant incremental change (Martin, 2012). Path destruction can be caused by vested interests, institutional rigidities, sunk costs and/or shocks (Boschma and Frenken, 2006). Development paths can be renewed when heterogeneity within an institutional regime has reached a tipping point. Path renewal is non-linear and hard to predict.

In summary: institutional regimes, defined as a set of similarly featured rules and networks, and the actors that produce and reproduce them (Crouch, 2005: 23), are likely to condition innovation outcomes of firms. They have various characteristics. They are (1) nested (business system -> innovation system -> firm competences and strategies), (2) multi-spatial (international, national, local and firm), (3) institutionally path-dependent, and (4) they condition, but do not determine innovation outcomes.

2.5.2 TOWARDS AN EXPLORATORY MODEL

Based on these conclusions and the more detailed descriptions of the three perspectives, this section proposes an exploratory model of incremental innovation of craft exporters in emerging economies. The model combines the three discussed perspectives in order to increase their explanatory power. It also aims to move from description to analysis. The ultimate aim is to explain the level of innovation of craft exporters in emerging economies. The model incorporates the variety of firm strategies and competences within business systems and the multiple levels and nests of the institutional regimes, by modelling both the institutional regime and the various individual factors that affect innovation at the international, national, local and firm level. Thus, the model analyses to what extent the multilevel institutional regime and/or its individual factors affect innovation outcomes (Mollinga and Gondhalekar, 2014).

However, as can be deduced from the theoretical conclusions given above, the model cannot fully explain incremental innovation of craft exporters, because the firms' innovation behaviour is not only influenced by the incentives of the business and innovation system, but also by profit incentives and opportunistic behaviour of the entrepreneur, market fluctuations, and shocks such as natural disasters. By the same token, path dependence and renewal cannot fully be modelled, because they are non-linear and the underlying processes are not yet well understood. Hence, the model is perceived as exploratory and not explanatory.

Figure 2.2 depicts the proposed exploratory model. The boxes and thick arrows on the left side depict the institutional regime, defined as sets of similar featured

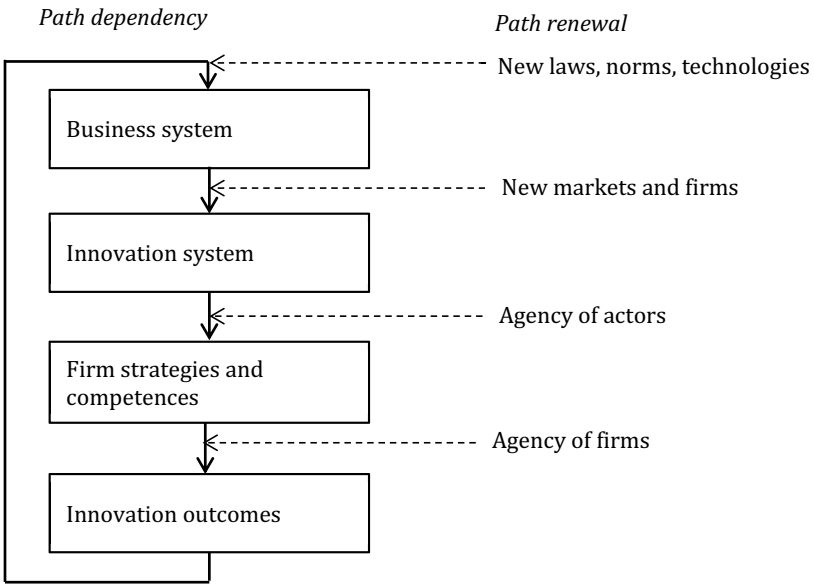
rules, and the actors that produce and reproduce them (Crouch, 2005: 23). As discussed, the regime is nested whereby higher order subsystems condition the lower-level subsystems. The business and innovation systems comprise of actors, rules and networks that co-occur and co-relate across spatial levels. The actors, rules and networks materialise at the level of the subsystems, and will be specified under these headings.

The highest institutional subsystem is the business system, defined as the systemic coordination among international, national and local actors impacting on the production of firms. It is based on the discussed literature on business systems (Whitley, 1992, 1999, 2000) and varieties of capitalism (Hall and Soskice, 2001). I operationalise business systems narrowly as the basic international, national and local institutions and actors affecting a local economy, in order to separate it from innovation systems and firms´ competences and strategies. International institutions and actors are measured as the transactional dependence on global buyers and multinationals (Gereffi *et al*., 2005), which may greatly effect craft exporters in emerging economies. The coordination by national and local actors is characterised by three institutional features (Whitley, 1999: 48). The first is the dominance of the government and intermediate actors regulating markets and sharing risks with craft exporters, as indicated by the strength of industrial policies, regulations and programmes at the national and local level. The second institutional feature comprises the control and financial systems relevant for craft exporters, as indicated by the strength of the financial sector, trade unions and collective bargaining practices in craft exports (note that skill development is treated as a feature of innovation systems). The third institutional feature is the perceived level of national and local cooperation between the government, intermediate actors and craft exporters.

The innovation system is the second layer of the multilevel institutional regime. The specific business system of a territory conditions the way that innovation systems work, but sectoral and sub-national variation is likely to surface (Allen and Alfred, 2009; Whitley, 1992; Witt and Redding, 2013, Strambach and Storz, 2008; Schneider and Paunescu, 2012). The innovation system is defined as the systemic knowledge interaction among suppliers, traders, global buyers, government and intermediary actors. It has three components: global value chains, local innovation systems (including factors at the national level) and other sources of knowledge. The global value chain describes the intensity and frequency of knowledge exchange and spillover between global buyers, traders and local suppliers and taking place at trade fairs, as well as the mode of governance, roles and levels of trust that shape knowledge exchange and spillover (Gereffi *et al.*, 2005; Humphrey and Schmitz, 2002; Pietrobelli and Rabellotti, 2011). The local innovation system describes knowledge exchange and spillover between local and

national knowledge actors, as well as the knowledge institutions that embed them. These institutions include national and local innovation policies, programmes, regulations, education and training systems and relationships of trust that shape knowledge exchange and spillover (Asheim and Isaksen, 2002; Lundvall, 2007: Lundvall *et al.*, 2002). Other sources of knowledge are measured as the intensity and frequency of the use of the Internet and written documents in any form.

Figure 2.3 Exploratory model



The business and innovation systems subsequently mould the strategies and competences of firms, as the third layer of nested institutions (figure 2.2; Carney *et al*., 2009; Rafiqui, 2009). However, there is room for agency, since firms do not necessarily follow rules blindly and/or incentive systems of higher institutional nests may be imperfect (Geels, 2004; Rafiqui, 2009). Firm strategies, defined as the long-term plan and activities to achieve innovation objectives, may be inward-looking in order to increase efficiency and/or outward-looking in order to increase the number of customers (Damanpour and Gopalakrishan, 2001; Ornaghi, 2006). They also relate to the IPR strategies of firms. Firm's competences are measured based on their ability to absorb external knowledge. These are described in detail

by Flatten *et al.* (2011), Jansen *et al.* (2005), MacPherson and Holt (2007) and Zahra and George (2002).

The model, before including path dependence and renewal, can be summarised as follows:

$$i = \sum x\beta + \sum y\beta + c$$

Whereby i is the level of incremental innovation of firms, x represents the membership scores of the institutional regime of each of the three case studies, y represents all individual factors that influence innovation, as measured at the level of the firm, c is the constant, and β is the vector of regression coefficients which the study wishes to estimate.

The level of incremental innovation is the dependent variable, measured as its perceived overall level, level of process innovation and that of product innovation. The institutional regime, as an independent variable, is given a numeric value in a fuzzy-set analysis. It represents, as will be discussed in section 2.5.4, to what extent each case study resembles a particular ideal type of institutional regime. The individual factors that may affect innovation are independent variables as well. At first sight, the model appears to have variables at only two levels: the level of the institutional regime (x) and the firm (y). However, the data on the institutional regime is multi-spatial. Survey data of firms also includes data on their international, national and local networks. The model therefore assesses to what extent the multi-spatial institutional regime and/or the variety of the firm's networks, competences and/or strategies explain the firms' innovation differences.

The above presented model takes a snapshot of time, assuming an equilibrium. In reality, however, institutional regimes change slowly most of the time, possibly intertwined with outbursts of radical change. These evolutionary patterns of the three case studies are analysed based on the institutional path dependence of the institutional regime. This entails that the present institutional regime is explained based on its historical path, whereby early decisions and outcomes are likely to have a lasting effect on its present characteristics and all institutional change is irreversible. Certain recent events may influence the formation of the institutional regime more strongly than other events as well (Martin, 2012). The evolution is analysed through process-tracing, which is a qualitative research methodology analysing sequential events in order to draw causal configurations and mechanisms that explain the present situation (Bennet, 2010; Blatter and Blume, 2008; Collier, 2011). The relative importance of each factor that may change at each of these sequential events is assessed, as well as its irreversible impact.

The institutional regime is prone to radical change if the business system in which it operates is weak, flexible and/or heterogeneous. New laws, norms and technologies may alter the business system. New local, national or global markets may be opened and new firms may be attracted to the sector, which may change the innovation system. Within the innovation system, actors such as the Chamber of Commerce may opt to change their role. Finally, firms have agency as well: they may deviate from the rules of the game and opt to take the risk to innovate differently. Once heterogeneity within the institutional regime has reached a tipping point, it changes radically.

The resulting dynamic model faces methodological challenges, which are inherent to the three perspectives studied. The first methodological challenge is the mismatch between configurational theory and research methods. Institutional regimes structure institutions and actors as a coherent whole, but the relationship between the institutions and actors within institutional regimes is non-linear and their causality is not symmetric. While institutions and actors may be causally related in one institutional regime, they may be unrelated or even inversely related in another regime (Meyer *et al.*, 1993 in Fiss, 2007). Regression analyses cannot fully analyse and comprehend these complex, non-linear relationships. Therefore, the study conducts fuzzy-set analyses, which is a superior methodology in comparative institutional regimes. It enables a better link between theory and research and hence contributes to turning perspectives into exploratory models (Fiss, 2007; Kvist, 2007; Rihoux, 2013; Schneider *et al.*, 2010). The second challenge is the relatively large number of independent and intermediate variables, which leads to time-consuming data collection and to a 'degrees of freedom' problem. This problem has been addressed in the operationalisation of the research (see section 3.2). The third challenge is that the evolutionary analysis tends to remain descriptive, due to the large number of sequential events and factors that may affect changes in institutional regimes and the limited understanding of evolutionary processes. While these challenges are partially addressed by using a process-tracing approach, the explanatory power of the evolutionary aspect of the study remains relatively thin.The fourth challenge is the risk of endogeneity: is it the institutional regime that makes craft firms more innovative, rather than that innovation makes certain institutional regimes more likely? Scholars in innovation systems, business systems and varieties of capitalism argue that institutional regimes affect innovation. The theoretical argument is, in brief, that stronger coordination among actors enable firms to build on existing knowledge and incrementally develop new products and processes. Hence the level of incremental innovation increases. By contrast, weaker coordination reduces the firms' opportunity to incrementally build on existing knowledge, leading to lower levels of incremental innovation. This argument is detailed in section 2.5.4. The counter argument that incremental innovation affects business

systems is less convincing. Radical innovations such as the invention of the automobile and computer have (re)formed institutional regimes, but incremental innovations are less likely to be path breaking. Therefore, based on theory the risk of endogeneity appears to be relatively small.

2.5.3 MODEL VARIATIONS

As noted in chapter 1, the research adopts an exploratory approach. It searches for new perspectives and concepts in order to appreciate the differences between the three case studies. As a result, model variations are used for the case studies and the comparative analysis.

Chapter 4, on Yogyakarta, uses a model that treats the institutional regime contextually, and aims to assess the impact of individual factors on innovation outcomes. It also does not adopt an evolutionary perspective. As noted in chapter 1, the importance of the evolving institutional regime only became apparent after analysing the second case study on Cape Town. The study subsequently collected new data on Yogyakarta and included the case study in the comparative analysis.

The model used in chapter 4 therefore does not analyse the impact of the institutional regime, but instead focuses on its functioning within one specific institutional context. It therefore cannot answer all research questions, but only answers the first question within its specific institutional context: 'what is the impact of innovation systems on incremental innovation?'. It specifically relates to the discussed perspective of innovation systems in emerging economies, as discussed in section 2.2.3. The model that is used aims to assess whether absorptive capacity mediates the impact of global value chains and local innovation systems. It is as follows:

$$i = \sum \eta\beta + \sum \theta\beta + \sum \mu\beta + c$$

Whereby i is the level of incremental innovation of firms, η is the factor of absorptive capacity, θ is the factor of global value chains, μ is the factor of the local innovation system, c is the constant, and β is the vector of regression coefficients which the study wishes to estimate.

Chapter 5, on Cape Town, uses a more elaborate model. In fact, it applies the full statistical model in order to analyse the effect of the segmented business and innovation system in Cape Town on innovation. The two segments of the business system are analytically treated as two completely different business systems. The model is, therefore, as follows:

$$i = \sum x\beta + \sum y\beta + c$$

Whereby i is the level of incremental innovation of firms, x represents the membership scores of the institutional regime of each of the three case studies, y represents all individual factors that influence innovation, as measured at the level of the firm, c is the constant, and β is the vector of regression coefficients which the study wishes to estimate.

However, as Cape Town has not renewed its institutional regime, its evolutionary analysis only considers institutional path dependence and not path renewal. The analysis therefore focuses on the major effects of early events (i.e. during colonialism and apartheid) and selected recent events on the present segmentation of the institutional regime.

Chapter 6, on Yiwu, uses a similar model in order to assess if the institutional regime resembles a dependent economy and whether this resemblance explains innovation outcomes. However, as only one institutional regime is studied, the model is as follows:

$$i = x\beta + \sum y\beta + c$$

Whereby i is the level of incremental innovation of firms, x represents the membership scores of the institutional regime of Yiwu (as opposed to that of three case studies), y represents all individual factors that influence innovation, as measured at the level of the firm, c is the constant, and β is the vector of regression coefficients which the study wishes to estimate.

This case study analyses institutional path dependence and renewal. Chapter 7, the comparative analysis, uses the full model as described in the previous section. The study has collected new data on Cape Town and Yogyakarta in order to conduct the analyses.

2.5.4 IDEAL TYPE INSTITUTIONAL REGIMES: PREPARING A FUZZY-SET ANALYSIS

The above sections have described the exploratory model and its variations. It also notes that the mismatch between theory and research can be addressed in a fuzzy-set analysis, whereby ideal types of institutional regimes are identified and cases are categorised according to theory (Kvist, 2007). This section describes the first step of a fuzzy-set analysis: to identify ideal type institutional regimes with different innovation outcomes. Each ideal type describes a theoretically constructed institutional regime. The ideal types are reflected in a table, called a truth table, which presents a combination of indicator scores for each ideal type.

The analyses of chapter 6, on Yiwu, and 7, on the comparative analysis, subsequently compare the scores of the truth table with the empirical scores of each case study, indicating to what extent a case study resembles an ideal type or not. Regression analyses subsequently test to what extent the institutional regime explains the innovation outcome, and if the expected innovation outcome is confirmed or not.

Inspired by Griffiths and Zammuto[4] (2005), I propose four ideal type institutional regimes (table 2.1). The ideal types are defined by the relative strength of the international and local/national actors in the business system. The business systems are the highest order institutional subsystem and are therefore expected to be most influential. The *x-axe* of table 2.1 measures the extent to which global buyers coordinate the local economy, indicated by the transactional dependency of suppliers and local traders on global buyers (Gereffi *et al.*, 2005). It ranges from a weak to strong coordination. The *y-axe* measures the role of the government and intermediary actors in economic coordination, as indicated by the strength of the local and national aspects of the business systems (i.e. the dominance of the government and intermediary actors; the strength of the control and financial system; and the level of coordination). It also ranges from weak to strong.

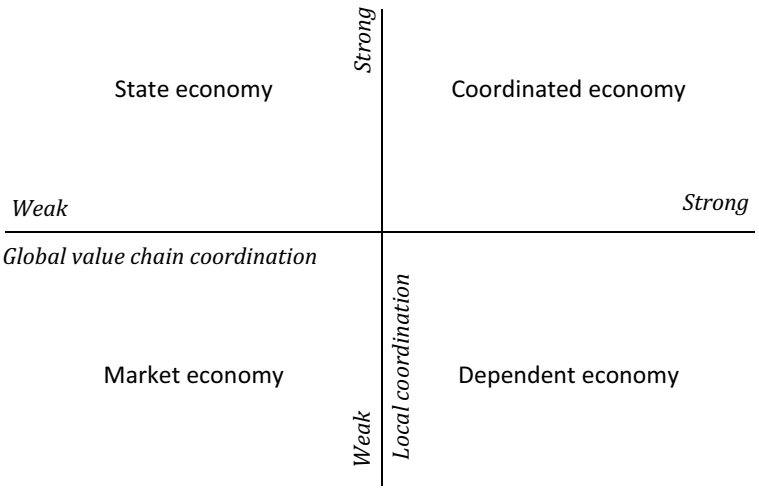
Their combination leads to four quadrants: (1) a *market economy*, which has a weak coordination by local and international actors; (2) A *dependent economy,* which has weak local coordination in combination with strong coordination by global buyers and multinationals; (3) A *state economy*, which has strong local coordination by the state and intermediate actors and weak coordination by global value chains; (4) A *joint economy*, which has strong local, national and international coordination. I realise that the typology is a simplification of reality. In reality, every institutional regime is unique, with its own specific role of the state, intermediary actors and firm hierarchies. The classification can be made more fine-grained in order to better reflect the multitude of realities, but such a detailed classification is not required for the purposes of this study. The proposed classification aims for the study to relate the ideal types to the exploratory model and at a later moment to relate the ideal types to the case studies (Kvist, 2007).

The section now discusses each ideal type in greater detail, describing its type of business system, innovation system and firm competences and strategies. While

[4] Griffiths and Zammuto (2005) propose four different 'institutional governance systems', depending on the level of value chain integration and state coordination. Value chain integration assesses to what extent and how industrial corporations control global value chains and state coordination assesses the relative strength of the state in coordinating the economy.

the ideal types differ on most variables of institutional regimes, all institutional regimes that enable firms to export rely on education and training systems and firms in all institutional regimes are likely to protect their intellectual property rights and acquire data from the Internet and other public sources of knowledge. The ideal types are summarised in table 2.2.

Table 2.1 Typology of institutional regimes in emerging economies



A market economy

In a market economy, both the international and local coordination of the business system is weak. Firms sell at arm's length instead of in relational or captive global value chains. Governments and intermediate actors leave economic activity to the numerous and anonymous interactions between buyers and sellers (Crouch, 2005; Crouch *et al.,* 2009). However, all market economies combine a pure market environment with a procedural government and firm hierarchies (Crouch, 2005). Governments and intermediaries set rules, provide basic services, and may offer tariff protection and export promotion schemes. Those rules and services are offered in all economies, albeit not always efficiently (Best, 1990; Crouch, 2005; Griffiths and Zammuto, 2005). Control systems, such as trade unions and collective bargaining, and financial systems are expected to be absent or weak (table 2.2; Crouch, 2005; Nölke and Vliegenthart, 2009).

Innovation systems within a market economy are often weak as well. Governments are likely to refrain from innovation policies, programmes and regulations, as innovation is left to the market, contacts are fleeting and knowledge exchange is likely to be limited to price setting in markets (table 2.2). Arm's-length global value chains leave contacts to market transactions as well. Markets on their own cannot optimally reduce the transaction costs and other incentive problems that are caused by knowledge asymmetries, bounded rationality and opportunism (Storper, 2005). On the other hand, firms can acquire knowledge from the Internet and other public sources, and the education and training system may enable efficient production processes (table 2.2; Crouch, 2005; Griffiths and Zammuto, 2005).

Such a competitive environment conditions firms to rely on in-house competences, most likely leading to large firm-sizes (Griffiths and Zammuto, 2005; Whitley, 2000). Within hierarchical firms, innovations are derived from a small group of managers and engineers (Crouch, 2005; Nölke and Vliegenthart, 2009; Sturgeon, 2002). Large firms operating in oligopolistic markets may have sufficient competences and resources to engage in radical innovations (Hall and Soskice, 2001). However, small firms cannot share innovation risks outside the firm's hierarchy and may be caught in a structural inertia (Edquist *et al*., 2001: 173). In order to reduce innovation investments, firms are conditioned to imitate designs, brands and production processes (Griffiths and Zammuto, 2005). This is a highly competitive market, because prices of imitated products are low and investments in process innovations needed to remain competitive are not supported (Hall and Soskice, 2001; Nölke and Vliegenthart, 2009).

Dependent economy

The second typology combines a transactional dependency on global buyers with a weak or liberal market-economy. Such a dependency on local corporations, global buyers and/or multinationals, combined with weak state coordination, appears to exist in various emerging economies in Eastern Europe, Latin America and Asia (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009). As in market economies, the role of governments and intermediaries is limited to rule making and basic services. Control and financial systems, including trade unionism and collective bargaining, tend to be weak (table 2.2; Crouch, 2005; Griffith and Zammuto, 2005).

Dependent economies come in different colours and shapes. In some Latin American countries, multinationals strongly align with national and local government and conglomerates (Schneider, 2009). By contrast, research in Eastern European countries and in China highlights the dependence on corporate

decisions made by multinationals in their mother country (Allen and Aldred, 2009; Nölke and Vliegenthart, 2009). Complementarities between the global and local institutional regimes are less obvious in economies dependent on decisions made outside their territory. This thesis discusses the second form.

Dependent business systems create an environment that is conducive for firms innovating within value chains. Due to the limited role of local non-firm actors, local innovation systems remain limited to firm-firm networks (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009). Hence, the local innovation system scores medium: it includes firm-firm networks and excludes firm-non firm networks (table 2.2). Knowledge and risks are shared (albeit possibly unequally) within value chains, which creates innovation and learning opportunities for suppliers. However, these opportunities differ between the modes of governance (Gereffi *et al*., 2005). Relational and modular global value chains enable incremental innovation, assuming that local firms have sufficient capacity to absorb knowledge from multiple sources. By contrast, (quasi-) hierarchical global value chains are likely to skew innovation opportunities towards production processes, because global buyers retain design, branding and marketing. The building up of innovative capacities is restrained by strategies of global buyers, a local innovation system, and a mismatch between what universities deliver and what firms need (Dutrénit, 2007; Pietrobelli and Rabellotti, 2012; Gereffi *et al*., 2005). Due to processes of strategic coupling, (quasi-) hierarchical global value chains are most likely.

The business and innovation systems condition firm characteristics, strategies and competences. Some firms may be large manufacturers, but most suppliers are expected to be medium-sized, offering specialised products to global buyers within fragmented global value chains (Gereffi *et al*., 2005; Griffiths and Zammuto, 2005; Nölke and Vliegenthart, 2009). Dependency on firm hierarchies, in particular in (quasi-) hierarchical global value chains, is likely to condition suppliers to strategize cost reductions (Gereffi *et al.*, 2005). Innovation strategies are likely to be inward-looking, geared towards production departments (Damantour and Gopal-Akrishan, 2001).

State economy

The third typology combines a coordinated market-economy with weak or arm's-length global value chains. The government, local intermediary organizations and local firms strongly coordinate local production and innovation (Griffiths and Zammuto, 2005; Hall and Soskice, 2001), while the influence of the international economy only materializes through competition. Local coordination reduces transaction costs and moral hazards, if the members cannot extract rents or

monopolize activities (Storper, 2005). Non-firm actors aim to strengthen the functioning of markets by diffusing knowledge, setting standards, upgrading technologies and facilitating training and skills formation (Zhang and Whitley, 2013). State-coordinated economies range from economies with state-owned enterprises (Witt and Redding, 2013; Whitley, 1992), to economies with paternalistic governments (Zhang and Whitley, 2013), to economies governed by tripartite structures and economies with clustered small firms supported by intermediary actors and government (Whitley, 1992 and 2000).

The coordinating role of non-firm actors favours the emergence of local innovation systems, though these evolutionary processes are more difficult if the government is relatively weak or paternalistic, or the economy is monopolised by state-owned enterprises. In these cases, the typology loses some of its comparative institutional advantage in incremental innovation. Local brokering can bring in new ideas and hence facilitate incremental innovation (Glückler, 2007). On the other hand, weak integration into international markets limits firms to local markets and hence reduces the scale of production and demotivates process innovation (Griffiths and Zammuto, 2005). As a result, firms are likely to innovate products.

Firms are conditioned to share innovation risks within the locality, and are likely to be medium to large-scale, state-owned or state-controlled enterprises. Trade unionism, collective bargaining and trust can facilitate cooperation within firms, which eases knowledge absorption. The firm strategies are focused on product innovation, as too small export markets demotivate process innovation. Product innovations are mostly outward-looking, in order to assess market trends and product designs (Griffiths and Zammuto, 2005; Utterback and Abernathy, 1975).

Joint economy

The last typology combines a coordinated market-economy with coordinated global value chains. The government and intermediaries proactively support production and innovation processes and engage in reciprocal knowledge exchange (Malecki, 2004). At the same time, firms are strongly integrated into the global economy and maintain close contact with global buyers.

Local and international non-market coordination offers a large and multifaceted innovation system, whereby firms absorb and combine knowledge from the locality and global value chains. It opens up multiple non-market knowledge networks, which broadens the search for new knowledge. Technological gatekeepers can link global value chains to local innovation systems (Giuliani, 2011). This enables local suppliers to combine global and local knowledge into incrementally adjusted products and production technologies.

Firms are likely to remain relatively small, because they can share risks locally and globally. In order to innovate products and processes, their competences are expected to be balanced (Dutrénit, 2004 and 2007). Firms are likely to innovate products and processes in order to position themselves in relational and modular global value chains.

Table 2.2 summarises the indicators of the typological institutional regimes. It includes variables to which the ideal types are expected to be comparable.

Table 2.2 Elements of typological institutional regimes

Factors[1]	**Typologies**			
	Market	**Corporate**	**State**	**Joint**
Business system[2]				
Transactional dependence on global buyers	Weak	Strong	Weak	Strong
State dominance	Weak	Weak	Strong	Strong
Control and financial systems	Weak	Weak	Strong	Strong
Local coordination	Weak	Weak	Strong	Strong
Innovation system				
Local innovation system	Weak	Medium	Medium	Strong
Education and training system	Strong	Strong	Strong	Strong
Global value chains	Weak	Strong	Weak	Strong
Other sources	Strong	Strong	Strong	Strong
Firm competences and strategies				
Innovation strategy focus	--	Internal	External	Both
Innovation strategy	Imitating	Price fighter	Design	Pioneer
IPR strategies	Strong	Strong	Strong	Strong
Competences	Weak	Skewed	Skewed	Balanced
Control variables				
Product-market segment	Medium	Low	High	Medium
Size of firm	Large	Medium	Medium	Small
Innovation outcomes				
Product	Low	Low	High	High
Process	Low	High	Low	High

Sources: Asheim and Isaksen, 2002; Flatten *et al.*, 2011; Gereffi *et al.,* 2005; Humphrey and Schmitz, 2002; Lundvall, 2007; Macpherson and Holt, 2007; Ornaghi, 2006; Whitley, 1992; *Notes*: [1] This table describes the factors that are part of institutional regimes and may hence explain innovation outcomes. Chapter 3 operationalises these factors by identifying indicators. [2] Trade unionism and collective bargaining are not included, as these are weak in handicraft exports.

2.6 CONCLUSIONS

This chapter has positively but critically discussed three perspectives that explain incremental innovation of craft exporters in emerging economies: innovation systems, business systems and institutional path dependence. It concludes that each of these perspectives has merit, but remains descriptive and underdetermined. Each perspective answers a different research question. In summary, the perspective of innovation systems enables an analysis of innovation differences within a territory, using the innovation system contextually, and it describes different network entities of innovation systems (Binz et al., 2014). The business system perspective enables an analysis of innovation differences between countries and institutional path dependence enables a dynamic analysis, but it cannot stand on its own.

The three perspectives have been merged in order to increase their explanatory power. In the combined perspective, evolving institutional regimes explain differences in innovation outcomes. The perspective has subsequently been translated into an exploratory model, whereby the institutional regime is treated as multilevel, multi-spatial and dynamic. The model takes the variety within institutional regimes into account, but faces difficulty in including path dependence due to its descriptive nature. It excludes the effects of market fluctuations on innovation outcomes.

The remainder of the thesis will apply the theoretical perspectives and exploratory model. However, as the study adopted an exploratory multiple case study strategy, not all chapters use the full exploratory model. The thesis uses the perspectives and exploratory model as follows:

- Chapter 3 details the research methods and operationalises the exploratory model.
- Chapter 4 presents the case study on Yogyakarta. It uses the perspective of innovation systems in emerging economies and follows up on one of the two main questions arising out of the academic debate: does absorptive capacity mediate the impact of global values chains and local innovation systems on innovation? As a result, chapter 4 only applies a small portion of the exploratory model, that is, the innovation system, firm competences and strategies and innovation outcomes. The business system and institutional path dependence are not studied.
- Chapter 5 presents the case study on Cape Town. It applies the full exploratory model. However, as Cape Town has not renewed its institutional regime, the perspective of path renewal is not addressed.

- Chapter 6 presents the case study on Yiwu. It applies the full exploratory model. However, its institutional regime is only compared to one ideal type (a dependent economy).
- Chapter 7 presents the comparative analysis and applies the full exploratory model. It includes additional data on Yogyakarta and Cape Town in order to fill the empirical gaps that have arisen in chapter 4 and 5.
- Chapter 8 presents the conclusions. It reflects on theory based on the empirical findings and discussions presented in each chapter.

3 RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research design and methodology. It sets off with an explanation of the research strategy, including the approach taken to multilevel analysis, the reasons for selecting handicraft exports and the three case studies. The chapter subsequently operationalises the research and describes the methods of data collection and analysis, including fuzzy-set analysis. The chapter then discusses the stages of the research and the validity and reliability of the findings.

Each subsequent chapter also includes a concise description of the research design and methodology. The reason is that each empirical chapter zooms in on specific research questions, applying a subset of the variables, indicators and methodologies. Furthermore, the three case studies have been published as articles, which stand on their own.

3.2 RESEARCH STRATEGY

3.2.1 AN EXPLORATORY MULTIPLE CASE STUDY

The study applies an exploratory multiple case study strategy. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context (Yin, 2009). It is an appropriate research strategy when the researcher has no control over the contemporary phenomenon, and the contextual environment is important in understanding the phenomenon being studied (Baxter and Jack, 2008; Yin, 2009). In addition, it is suitable when the research is aimed at a deeper understanding of the topic being studied, and/or contributing to a broader academic debate (Bennett, 2010; Blatter and Blume, 2008; Thiel, 2014). As such, a case study enables a deeper level of analysis than initially posited in theory (Bennett, 2010). These criteria are valid for this study. Innovation is a contemporary phenomenon that is widely studied and is affected by multiple variables. All variables are outside the control of the researcher. Furthermore, the study aims to identify deeper institutional and evolutionary factors by combining three perspectives, and – by doing so – it broadens the theoretical discourse from an innovation-system perspective to evolving institutional regimes.

An *exploratory multiple* case study analyses more than one case study and raises new research questions for each of them (Yin, 2009). This approach is relevant in configurational analysis, because the complex causalities and non-linear relationships among variables within configurations bring different research questions to the fore. The variables may be causally related in one case study, and unrelated or even inversely related in another (Meyer *et al..* 1993 in Fiss, 2007). An exploratory multiple case study approach is applicable in this study, which aims to understand the effect of institutional regimes, as configurations, on incremental innovation of craft exporters in different institutional regimes. The different institutional contexts of the case studies demand different research questions.

The advantage of an exploratory multiple case study approach is that it explores factors outside the initial scope of the research. Case studies assess a contemporary phenomenon within its context, but the mere fact that a phenomenon is contextual to a theoretical model is not very enlightening or rewarding. However, these contextual factors can be identified, measured, understood and incorporated into the model, by broadening the research scope to rival theories and keeping an eye on previously unknown factors (Blatter and Blume, 2008). This research has taken up the challenge. Initially, the Yogyakarta case study started off by conducting a co-variance and qualitative analysis (Collier, 2011), with the relatively limited number of factors explaining innovation, as discussed by the innovation system perspective. Its specific research question is:

> Research question of the Yogyakarta case study:
> How does absorptive capacity mediate the impact of global value chains and local innovation systems on incremental innovation?

However, data outside the framework of innovation systems was collected as well, in order to appreciate the real-life context. During the research journey, it was learned that some of these contextual factors significantly influence innovation. The case study in Cape Town subsequently found that the segmentation of the business system – the second theoretical perspective described in chapter 2 – best explains differences in incremental innovation among firms within its institutional context. Therefore, the theoretical scope expanded and the research question has been redefined as follows:

> Research question of the Cape Town case study:
> How does the segmented business system explain differences in incremental innovation?

In the Yiwu case study, the study found an extraordinary high level of process innovation. The business system was not segmented, on the contrary, it strongly conditions firms to innovate processes. This finding triggered a further elaboration of the research scope and the following research question:

> Research question of the Yiwu case study:
> How does the evolving institutional regime explain a high level of process and low level of product innovation?

The concluding comparative case study subsequently raised the following research question, while applying the same scope of research:

> Research question of the comparative analysis:
> How do evolving institutional regimes explain differences in the level of incremental innovation?

In concrete terms, the exploratory multilevel case study approach has enabled me to expand my understanding of incremental innovation from an innovation-system perspective to that of evolving institutional regimes. This iterative process has made it possible to use the full richness of empirical data, whereby quantitative and qualitative data jointly prove congruence (Blatter and Blume, 2008). Comparing concepts potentially enables a strong contribution to the theoretical discourse (Blatter and Havenland, 2014: 162).

The exploratory multiple case study approach also has a disadvantage: it is at odds with the more common approach of literal replications, where the cases are expected to yield similar results, and the approach of conceptual replications, where case studies apply the same concepts and research methodologies, but the innovation outcomes are expected to differ (Yin, 2009). While literal and conceptual replications compare case studies, an exploratory multiple case study approach does not, since it explores different research questions. As a result, the robustness of the findings is low compared to literal and conceptual replications. I address this weakness as much as possible by comparing the case studies based on the main research question and newly collected data in the configurational comparative analysis of chapter 7.

The case study approach also has other drawbacks. A first drawback, as already mentioned, is that statistical generalisation is limited. A second shortcoming is that the study may suffer from the 'infinite regress' problem. This entails that an exceedingly fine-grained level of analysis is sought in order to study causal steps. The question is how deep an institutional and evolutionary analysis of incremental innovation ought to be. A third and closely related drawback is that case studies may have a 'degrees of freedom' problem, as the number of cases is small and the number of variables is large. However, even a single case study may offer many observations, and one observation may be enough to falsify a theory. The problems have been overcome by applying a mixed methodology. In quantitative analysis, hoop tests and smoking gun tests have been conducted (Bennett, 2010). Hoop tests can eliminate alternative hypotheses, but do not confirm a hypothesis. Smoking gun tests confirm a hypothesis, but failing the test does not eliminate alternatives.

3.2.2 MULTILEVEL ANALYSIS

Each case study incorporates data at different spatial and institutional levels, as explained and justified in sections 2.3.3 and 2.3.4. Data is collected in three instruments. The first is a survey of firms (for a discussion on the use of surveys in multilevel analysis, see: Fidell and Tabachnick, 2007). The survey collects firm-level data on strategies, competences and characteristics, as well as data on the local, national and international networks of firms and knowledge spillover. Where relevant, the data is aggregated to the level of business or innovation systems. Additional data on the business and innovation systems is collected in semi-structured interviews with firms and other respondent groups, such as universities, business associations and chambers of commerce, and from secondary data. The use of different data collection instruments results in comprehensive multilevel data for each of the case studies.

The data is incorporated into an exploratory model, which takes the firm as unit of analysis and adds data of higher-order institutional levels. Such a contextual effects model adds the 'contextual' institutional factors to the analysis of firms. It enables regressions on innovation differences between firms within each case study – whereby data on business and innovation systems may become contextual to the model – and an analysis between case studies, whereby data on institutional regimes differ between the case studies and firm level variables vary between firms. The model enables an assessment of the relative effects of institutional regimes and of independent and control variables individually (Mollinga and Gondhalekar, 2014). The model is summarised as follows (see section 2.5.2):

$$i = \sum x\beta + \sum y\beta + c$$

Whereby i is the level of incremental innovation of firms, x represents the membership scores of the institutional regime of each of the three case studies, y represents all individual factors that influence innovation, as measured at the level of the firm, c is the constant, and β is the vector of regression coefficients which the study wishes to estimate.

3.2.3 THE SELECTION OF HANDICRAFT EXPORTS

The selection of handicraft exports as a case study is uncommon in innovation studies, since most studies zoom in on high-tech sectors or mass-produced, standardised low-tech exports. Adding a new sector potentially increases the robustness of innovation studies. Within this context, this study has selected

handicraft exports as a highly relevant and viable sector to study. The following five reasons elucidate why:

1) A study of handicraft exports is relevant to the problem statement and research question, because incremental innovation is key to the success or failure of craft firms in emerging economies. A unique feature of creative industries, including handicrafts, is that the market is buyer-driven, while at the same time ethnic design may create relatively strong comparative advantages. These tensions between market control by global buyers and unique local designs pan out in a variety of global – local linkages. These range from asymmetrical markets controlled by global buyers, to symmetrical markets where suppliers sell unique (ethnic) designs which are in demand by many buyers. These global-local linkages differ across space and time, which adds to the relevance and depth of the study (UNCTAD, 2010, 2013, 2015).

2) Handicraft exports represent a large and growing industry in emerging economies (UNCTAD, 2015). Its understanding therefore offers a small but relevant contribution to a deeper understanding of economic growth and learning in emerging economies.

3) Handicraft exports are understudied[5]. It is a subsector of the cultural industry, which has been more widely studied. However, the cultural industry is not often studied from the perspective of innovation systems, as the industry is expected to be innovative by its very nature (Sunley *et al*., 2008). The creative industry includes distinctly different market segments. Sunley *et al.* (2008: 676) note:

   > 'Whilst the cultural industries share a number of common underpinnings, including a focus on ideas, often with a strong aesthetic component, they differ from one another in a wide range of respects, such as relationships with markets, the nature of their distribution channels and intellectual property rights.'

   Innovation in handicrafts differs distinctly from that in other creative industries, such as film, music, architecture, marketing and computer software, as it operates in a distinctly different market, with different distribution channels and intellectual property rights (UNCTAD, 2010 and 2013). Innovation of handicrafts therefore demands a separate study focus.

[5] See section 1.2.

4) It is viable to study handicraft exports in emerging economies as a distinct sector. Handicraft exports share a market and represent a distinct technological regime (Nelson, 1994), with clearly demarcated products, which can be delineated from other sectors (CBI, 2009). The technological regime of a sector, comprising the technological complexity, appropriability and accumulation of knowledge, demarcates innovation opportunities from those in other sectors (Nelson and Nelson, 2002). The technological regime of handicrafts is characterised by a relatively low level of complexity of technologies and weak rules of appropriation. These features enable a relatively fast flow of knowledge and low barriers of entry. As a result, handicraft exports tend to be a sector within which firms in developing economies first encounter global markets. However, the importance of knowledge accumulation has increased over time, due to shortened product cycles and heightened product and service standards. The sector is increasingly influenced by trends in interior design and fashion. Christmas, spring, summer and fall demand craft products with different colours, functions and forms. A premium is offered for products that are new, distinct and responsive to quickly changing market trends and market niches (USAID, 2006; UNCTAD, 2010 and 2013). As a result, barriers of entry have been raised over the last decades: while firms may still be able to export small quantities of ethnic products without prior knowledge, the acquisition of a larger share of the global contemporary handicraft market demands accumulated knowledge. This knowledge has been accumulated within a few selected territories around the world.

5) Finally, handicraft exports comprise a multitude of market and product segments. The segmentation increases the robustness of the research findings. At the same time, the study results remain valid, since the analyses have been controlled for variations in markets and products.

The sectoral choice has two disadvantages. The first is that the unusual choice potentially reduces chances of publication, as most periodicals focus on radical innovation in high-tech industries. The second disadvantage, as described more elaborately in section 1.9, is that the sectoral diversity potentially limits the internal validity of the findings. This weakness is addressed by controlling for diversity. Furthermore, the sector selection fits in the academic tradition of innovation studies, which often study diverse sectors (see for instance Chaminade and Vang, 2008; Cooke, 2004; Moodysson et al., 2008; Sternberg and Muller, 2005; Strambach and Storz, 2008; Sturgeon et al., 2008; Sunley et al., 2008). Nevertheless, due to the reduced internal validity, the thesis is interpreted as a

collection of explorative cases. Further research is recommended in order to test the findings.

3.2.4 THE SELECTION OF CASE STUDIES

I selected three case studies using Mill's Method of Difference (variation in control and dependent variables is maximised). This method of selecting case studies improves the robustness of research findings, and therefore enables generalisations of research findings to handicraft exporters in emerging economies. Case studies have been selected stepwise. Yogyakarta was selected first, based on prior knowledge of its innovation systems. Cape Town and Yiwu were subsequently selected as cases with different dependent and control variables. The case studies have also been selected for pragmatic reasons. In those countries, I benefit from strong partnerships with local universities over a sustained period of time. The local universities kindly offered local research assistants, which eased knowledge collection, contextualisation and logistics. Before my arrival, the local assistants had made appointments and they joined me during fieldwork. The local partners furthermore offered valuable feedback on research findings, which improved the internal validity of the study results.

3.3 OPERATIONALISATION

The concepts, as defined and described in chapter 2, have been operationalised by identifying sub-variables and indicators. The dependent variable is innovation and the independent variable is the evolving institutional regimes, comprising the business system, innovation system, firm strategies and competences and institutional path dependence. This section operationalises the concepts. The descriptive statistics of all indicators measured in the survey is in annex 3.

3.3.1 INCREMENTAL INNOVATION

Generally speaking, innovation is measured by objective indicators such as the number of patents and/or number of engineers and architects. However, these indicators primarily measure radical innovation (Marins, 2008). In order to measure incremental innovations which are often not visible to the naked eye, the standard procedure in innovation research is to use subjective indicators (OECD, 2005 and 2006). These, in combination with objective indicators and observation,

subsequently enable a strong measure of innovation (table 3.1). Measuring perceptions has the added advantage of indicating the meaning and importance that craft entrepreneurs attach to innovation. Perceptions of innovation outcomes are real to the entrepreneur, which is arguably at least as relevant as objective indicators identified by external researchers.

I measure various entrepreneurial perceptions of innovation: the overall level, the level of product innovation (products are new to the world, region, sector or firm) and the level of process innovation (OECD, 2005 and 2006). Measuring process innovation is a specific challenge, since entrepreneurs tend to attach greater importance to product innovations and product innovations tend to require process innovations (Damantour and Gopalakrishan, 2001). Skewed process innovation is measured based on a dummy variable that assesses priority given to process innovation. Descriptive statistics on innovation are in annex 3.

Research validity is increased by correlating the subjective measures with objective measures of innovation rents and observations during the field visits. Relevant objective indicators of innovation rents are selected based on secondary data (Brata 2009 and 2011; OECD, 2005 and 2006; Geenhuizen and Indarti, 2010; Marins, 2008) and are tested in a pilot study (see table 3.1). The study finds that most craft exporters have been able to increase the quality of their products, while the firms' perceived innovation level to a significant degree correlates with an increase in the number of buyers, an increase in the number of products, improved product and staff quality and cost reductions.

Table 3.1 Innovation indicators

Indicators	Abbreviation	Level of analysis	Source	Scale
Perception overall innovation	Innovation	Firm	Survey	1-5
Perceived newness of products	Product innov.	""	""	1-4
Focus on process innovation	Process innov.	""	""	1-2
Observed innovations	--	""	Qualitative	
Innovation rents				
Cost reductions	--	""	Survey	1-5
Quality improvements products & staff	--	""	""	1-5
Increase in number of buyers and products	--	""	""	1-5

Sources: Marins 2008; OECD 2005.

Note: The indicators included in the survey are also measured qualitatively.

3.3.2 BUSINESS SYSTEMS

In line with the theoretical discourse of chapter 2, the study operationalises the business system as the institutional foundation for local economic coordination, as set by international, national and local actors. Contrary to the definition of most business system scholars, it is multi-spatial. The definition follows Whitley (1992, 1999, 2000), as opposed to Hall and Soskice (2001), in attaching importance to the coordinating role of governments, intermediate actors and firms. Furthermore, based on the recent studies on dependent economies, it adds global buyers as an international actor (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009).

I operationalise the business system at the international, national and local level. Schneider (2009) uses foreign direct investments and dependence on international trade as indicators of international institutions and actors. Foreign direct investments only play a marginal role in the handicraft sector and are therefore not included as an indicator. I therefore only use the share of international trade. A high share may explain a dependent economy, if it is complemented with a limited or liberal role of national and local institutions and actors (Schneider, 2009). The export share of craft exporters in measured in the survey and aggregated to the level of the case study. It is compared with national export share, as given in the Global Competitiveness Report (Schwab, 2015).

Indicators of national and local coordination are derived from Whitley's (1999: 48) key institutional features of business systems. The first institutional feature is the dominance of the government and intermediate actors in regulating markets and sharing risks with craft exporters. This is indicated by the strength of industrial policies, regulations and programmes at the national and local level. The data is acquired in semi-structured interviews and secondary data. It considers the strength of national level policies, regulations and programmes, as derived from the Global Competitiveness Report (Schwab, 2015), policy documents and secondary data. It also considers specific local policies, regulations and programmes as acquired in semi-structured interviews and from secondary data. This indicator also considers whether local intermediate actors run specific programmes directed at crafters. The question raised is whether the institutional features affect craft exporters or not. For instance, a country may have excellent national industrial policies, but if these are irrelevant for the craft exporters of the case study, as indicated in semi-structured interviews, they have been excluded.

The second institutional feature is the control and financial system governing craft exporters. Whitley (1999: 60) recommends five indicators: the strength of the financial sector, the strength of trade unions, the organising principle of union organisation, the centralisation of bargaining, and the strength of the public

training system. I use the strength of the financial sector, the strength of trade unionism and the centralisation of bargaining as indicators. The organising principle of trade unionism proved to be irrelevant, as trade unionism is absent in all three case studies. Public training is included as an indicator of the innovation system

The third institutional factor is the level of national and local cooperation, based on relationships of trust and authority. Whitley (1999) considers trust in formal institutions, which I operationalise as the perceived reliability of formal institutions according to the Global Competitiveness Report (Schwab, 2015). Whitley (1999: 60) furthermore identifies forms of authority and trust. I indicated these by the perceived importance of national and local networks and the level of trust among actors, as measured in semi-structured interviews and secondary data. As a result, the study identifies strong ties of trust, strong ties based on hierarchy or paternalism and weak ties. This network typology offers an alternative to Whitley's forms of authority.

Table 3.2 Business system indicators

Indicators	Abbreviation	Spatial level	Source	Scale
Transactional dependence on global buyers	Export share	International	Survey	1-100
Industrial policies, programmes, regulations	Ind. policies	National, local	Qualitative	
Strength of financial sector	Fin. sector	National, local	Qualitative	
Importance of networks	Local networks	National/local	Qualitative	
Labour relations	Labour rel.	National/local	Qualitative	
Trade unionism	Unions	National/local	Qualitative	
Perceived reliability of formal institutions	Reliable int.	National/local	Qualitative	

Sources: Crough, 2005; Whitley, 1992, 1999 and 2000; Gereffi *et al*., 2005.
Note: The indicators included in the survey are also measured qualitatively.

Due to the operationalisation of business systems, its indicators differ from Hall and Soskice's (2001) indicators of varieties of capitalism. I find that only the financial system and industrial relations are included in both. The education and training system and the preferred mode for the transfer of innovations are included in the innovation system and the internal structure of the firm is seen as a firm level institutional variable. In summary: Hall and Soskice's indicators are

partially operationalised under the innovation system and the firm strategies and competences.

3.3.3 INNOVATION SYSTEMS

The innovation system is defined as the systemic knowledge interaction among suppliers, traders, global buyers, government and intermediary actors. I adopt a multi-spatial perspective, because firms exchange knowledge across spatial levels (Binz *et al.*, 2014). The multi-spatial innovation system is operationalised in three components: global value chains, local innovation systems and other sources of knowledge (Pietrobelli and Rabellotti, 2011).

The global value chain describes knowledge exchange between global buyers, traders and local suppliers. Knowledge exchange is indicated by the importance that craft exporters attach to knowledge from the global buyer. Knowledge exchange is expected to be influenced by the roles of actors, the mode of governance of global value chains and the level of trust between the actors (Gereffi et al., 2005; Humphrey and Schmitz, 2002; Pietrobelli and Rabellotti, 2011). The study identifies three roles of firms within global value chains: a global buyer, trader and supplier. Two modes of global value chain governance are studied: captive and relational (Gereffi *et al*., 2005). In a captive chain, buyers depend transactionally for 70% or more on one buyer. In a relational value chain, the dependency on buyers is less than 70%. Transactional dependence significantly correlates with a relationship of trust between buyers and local firms (dummy variable). Firms also sell at arm's-length, but this is never the main mode of governance. None of the other modes of governance are found in the study. The trust between craft exporters and global buyers is indicated by the perceived trust that the respondents have in global buyers. Finally, firms also acquire knowledge at trade fairs, where buyers, traders and suppliers may meet without a transactional relationship. This is indicated by the perceived importance of knowledge from trade fairs. All indicators are measured at the level of the firm and aggregated to the level of global value chains.

The local innovation system describes knowledge exchange and spillover between local and national knowledge actors, as well as the institutions that embed them. Networking among local firms is both a part of the global value chain and of the local innovation system. I decided to treat the local value chain as part of the local innovation system, because geographical proximity strongly determines knowledge exchange and diffusion (Boschma, 2005). The local innovation system comprises interactions within the local value chain (firm-firm relationships) and outside the local value chain (firm – non-firm relationships). Knowledge exchange

is measured by the importance that craft exporters attach to knowledge of national and local knowledge actors, and by the question whether firms are part of a cluster or not. Unintended knowledge spillovers are measured based on the perceived importance of labour mobility, observation and copying. All these indicators are measured at the level of the firm and aggregated to the level of the local innovation system.

National and local knowledge exchange is enabled by knowledge institutions. This is indicated by the ability of national and local innovation policies, programmes and regulations, as well as that of education and training systems build competences and knowledge networks of craft exporters. Informal institutions are indicated by the trust that craft exporters have in other local actors (Asheim and Isaksen, 2002; Lundvall, 2007: Lundvall et al., 2002). These indicators are measured in semi-structured interviews and secondary data.

The indicators are summarised in table 3.3.

Table 3.3 Innovation system indicators

Indicators	Abbreviation	Spatial level	Source	Scale
GLOBAL VALUE CHAINS				
Perceived importance of knowledge[1]	Global buyers	International	Survey	1-5
Mode of governance: quasi-hierarchical[2]	Quasi-hier..	""	""	1-2
Roles: trader/supplier[3]	Roles	""	""	1-2
Perceived importance of knowledge from trade fairs	Trade fairs	""	""	1-5
Trust in global buyer	Trust	""	""	0-1
LOCAL INNOVATION SYSTEM				
Perceived importance of knowledge of local/national non-firm actors[4]	Exchange state	Nation./local	Survey	1-5
Perceived importance of knowledge of firms	Exchange firms	"" Nation./local	"" Qualitative	1-5
Strength of education/ training system	Education	""	Survey	1-2
Perceived importance of observations	Observe	""	""	1-2
Location in geographical cluster	Cluster	Local	""	1-5
Spillovers: copying, labour mobility, observation	--			
OTHER				
Perceived importance of the Internet and written press	--	Multiple	Survey	1-5
Perceived importance of other international networks[5]	--	International	Qualitative	

Sources: Asheim and Isaksen, 2002; Gereffi *et al*., 2005; Humphrey and Schmitz, 2002; Lundvall, 2007; Lundvall *et al. 2002;* Pietrobelli and Rabellotti, 2011.
Notes: The indicators included in the survey are also measured qualitatively. [1] This indicator correlates with the question on daily, weekly, quarterly, yearly, or less frequent interactions. [2] Captive value chains depend on global buyers for at least 70% of sales; relational value chains, less than 70%. [3] Suppliers subcontract less than half of all products; traders, more than half of all products. [4] The local actors are traders, suppliers, chambers of commerce, business associations, cluster associations, government, universities and finance actors. This indicator correlates with the question on daily, weekly, quarterly, yearly, or less frequent interactions. [5] The respondents were asked about communities of practice, trade fairs, conferences, study tours, meetings with donor organisations and friendships.

3.3.4 FIRM STRATEGIES AND COMPETENCES

The exploratory model includes the firms' strategies and competences. Firms strategies, defined as long term plans and activities to achieve its innovation objectives, are measured by three indicators. The first is whether the entrepreneur is primarily inward-looking in order to increase efficiency and/or outward-looking in order to increase the number of customers (Damanpour and Gopalakrishan, 2001; Ornaghi, 2006). The second indicator is the use of brands by craft exporters in international, national and local markets. The third is the firms' IPR strategies, which range from applying for patents, to only working with trustees, innovating faster, or none.

Firm competences are measured based on the firms' ability to absorb external knowledge. Knowledge absorption takes place in four steps: acquisition, assimilation, transformation and exploitation (Zahra and George, 2002).

Acquisition refers to a 'firm's capability to identify and acquire externally generated knowledge that is critical to its operations' (Zahra and George, 2002: 189). Firms explore a large amount of knowledge from as many knowledgeable sources within innovation systems as possible in order to reduce uncertainty (MacPherson and Holt, 2007; March, 1991). Knowledge acquisition can be measured by many indicators, of which the following proved to be significant: international travel, language abilities, previous position and market knowledge.

Assimilation refers to the 'firm's routines and processes that allow it to analyse, synthesize, process, interpret and understand knowledge obtained from external sources' (Zahra and George, 2002: 189). Assimilation demands knowledge exchange within a firm. A range of firm-level abilities matter at this stage, such as firm size, education and training of staff, HRD, internal communication and organizational structure (Jansen *et al*., 2005). Open, flexible and communicative structures enable firms to quickly assimilate new knowledge (Jansen *et al*., 2005).

Transformation denotes a firm's ability to change its routines by combining old and new knowledge. Out of its assimilated pool of knowledge, a firm filters knowledge in which it wants to invest and subsequently manages and finances the re-organization of its routines (Acs and Plumer, 2005). Transformation demands investments, finance, business planning and R&D.

Exploitation is the ability of a firm to commercialize the transformed knowledge. The firm has to apply new routines in order to produce and market new products and services, apply new technologies and attract new markets with a specific set of marketing instruments (Zahra and George, 2002). New routines are highly specific and technical, where open communication across departments is not very beneficial. Instead, it demands a relatively closed knowledge exchange.

Table 3.4 Firm strategies and competences

Indicators	Abbreviation	Spatial level	Source	Scale
STRATEGIES				
Innovation focus: inward/outward	Outward	Firm	Qualitative	
Brand name	Brand	“”	Survey	1-4
IPR strategy[1]	--	“”	“”	1-4
ABSORPTIVE CAPACITY				
Acquire				
Frequency international travel	Travel	“”	Survey	1-5
Language abilities	Language	“”	“”	1-2
Previous position (none, crafts, elsewhere)	Previous	“”	“”	1-3
Market knowledge	Market	“”	“”	1-5
Assimilate				
Training	Training	“”	“”	1-5
Internal communication	Communication	“”	“”	1-2
Number of departments	Departments	“”	“”	1-5
Staff capacity	Staff cap.	“”	“”	1-5
Participation in decision making	Participation	“”	Qualitative	
Transform				
Investments	Investments	“”	Survey	1-2
Own finance of innovations	Finance	“”	“”	1-2
Business planning	Business plan	“”	“”	1-2
Exploit				
Balancing innovations	Balance innov.	“”	“”	1-5

Sources: Damanpour and Gopalakrishan, 2001; Flatten *et al*. 2011; Hall and Soskice, 2001; Jansen *et al*., 2005; Macpherson and Holt 2007; Ornaghi, 2006; Whitley, 1999 and 2000.

Notes: The indicators included in the survey are also measured qualitatively. [1] IPR strategies are: applying for patents; innovating at a faster pace; only working with trustees; and no action taken.

Flatten et al. (2011), Jansen et al. (2005) and MacPherson and Holt (2007) have tested the indicators of absorptive capacity with radical innovations in mind. Geenhuizen and Indarti (2011) and Indarti (2010) have to some extent adjusted the indicators to the handicraft sector. I have tried out the indicators during the pilot stage of the study. As a result, various indicators proved to be irrelevant and new ones were added. Irrelevant indicators include joint research teams within firms, cross-departmental teams and job rotation. New indicators include the language abilities within the firm, the frequency of international travel and the number of departments.

3.3.5 INSTITUTIONAL PATH DEPENDENCE AND RENEWAL

Institutional path dependence is defined as the irreversible and predictable change of an institutional regime over time, as a consequence of its own history (based on Martin and Sunley, 2006; MacKinnon, 2008). It is indicated by the inflexibility and ergodicity of mature institutional regimes, resulting in an unchanged distribution of product and process innovation, while at the same time shocks, market volatility and changes of individual institutions may take place. Historical events that have shaped the present institutional regime are indicated by the irreversible, self-reinforcing role of initial institutions, the (possibly accidental) impact of more recent events and by sunk capital investments, which give institutional regimes a certain hardness (Boschma and Frenken, 2006; Dosi et al., 2005; Essletzbichler and Rigby, 2007; Geels, 2004; Martin, 2012; Martin and Sunley, 2006; Rafiqui, 2009).

Path renewal is defined as a radical change in the innovation incentives of the institutional regimes, as indicated by a radical change in innovation outcomes of most firms operating within the regime at a certain moment in time. Path renewal is not necessarily indicated by a radical change in the institutional regime. The regime may have been changing gradually over a sustained period of time, but suddenly a threshold is reached and firms perceive the incentive structure differently. Five sub-variables may lead to path renewal. The first is a paradigm shift in institutions, as indicated by policy changes, a break of trust among actors (North, 1992; Williamson, 1995), institutional reform (Hall and Thelen, 2009, 20) and major shifts in global value chains (Gereffi, 2014). The second sub-variable is the entrance of firms into new global or domestic markets, thus bringing in new institutions (Gereffi, 2014; Martin and Sunley, 2006). The third is agency of non-firm actors (Rafiqui, 2009), indicated by new ways to implement policies and programmes (MacKinnon, 2008), which is more likely among new actors (Martin and Sunley, 2006). Fourth is agency of firms (Boschma and Frenken, 2011, indicated by outliers, labour conflict (MacKinnon, 2008), diversification (Martin and Sunley, 2006) and the wish to set up new institutions in order to fill

institutional gaps (Crouch, 2009). New firms are more likely to have agency (Carlsson, 2009; Sternberg and Muller, 2005). The final sub-variable is radical innovations applied by firms, such as the use of e-marketing.

All indicators are qualitative in nature and most may arise at the international, national or local level. While handicrafts, as a mature industry, are shaped in processes of institutional path dependence, its temporal path renewal is defined by non-predictability and non-ergodicity. The combination of initial path dependent events and game changers, which explain a contemporary institutional regime, can therefore only be identified with hindsight.

Table 3.5 Path dependence and renewal indicators

Indicators	Spatial level	Source
INSTITUTIONAL PATH DEPENDENCE		
Inflexible institutional regime	Multilevel	Qualitative
Stable process/product innovation over time	Firm	""
Irreversibility, self-reinforcibility of initial events	Multilevel	""
Impact of recent events	""	""
Sunk costs	Firm	""
PATH RENEWAL		
Radical change in product/process innovation	Firm	""
External shocks (physical and economic)	Multilevel	""
Paradigm shifts: new policies, regulations, programmes, trust relationships	National, local	""
New markets	Multilevel	""
Agency: actors with a major role	National/local	""
Radical innovations: application of new technologies and their effects on the firms	External to sector	""

Sources: Hall and Thelen, 2009; MacKinnon, 2008; Martin, 2012; Martin and Sunley, 2006; Strambach and Storz, 2008.

3.3.6 CONTROL VARIABLES

Various characteristics of the firm, entrepreneur and sector can predict innovation outcomes, but are outside the scope of the exploratory model. They have therefore been included as control variables. Firm characteristics that are included are firm ownership and size, which are known to influence innovation processes. Hall and Soskice (2001) include these in the operationalisation of business systems. Relevant entrepreneurial characteristics are the level of education, gender and age

of the entrepreneur (Erikson, 2002; Fransen, 2008; Hansen and Vaa, 2004). In the South African context, race is also known to influence innovation outcomes (Devey *et al.*, 2006; Herrington *et al.*, 2010). Finally, the analyses are controlled for sectoral variations, such as variations between the type of product that is produced and the product-market segment within which a firm operates.

3.4 DATA COLLECTION METHODS AND SAMPLING

The study applies a mixed research methodology. This section will describe the quantitative and qualitative methods and the sampling methods used.

Quantitative data is collected in order to describe variables at the level of the firm and to statistically analyse their relationships. A survey sample of 301 firms has been drawn, comprising roughly 100 firms in each case study (table 3.6). For each firm, the director has been interviewed. In his/her absence, a knowledgeable person was interviewed or the next firm on the database was selected instead. Generally speaking the firms were visited, but some respondents were called by phone. The survey questionnaire is given in annex 1 and the descriptive statistics derived from the survey are in annex 3.

Table 3.6 Control variables

Indicators	Abbreviation	Spatial level	Source	Scale
FIRM				
Size: number of employees	Employment	Firm	Survey	1-15,000
Size: turn-over (US$)	Turn-over	""	Survey	600-3bln.
Firm-age	--	""	Survey	1-43
Legal status[2]	Foreign-owned	""	Survey	1-4
ENTREPRENEUR				
Education entrepreneur[3]	--	""	""	1-7
Age	--	""	""	21-83
Gender	--	""	""	1-2
Risk-taking propensity	--	""	""	1-5
SECTOR				
Product segments[1]	--	Firm	""	1-7
Product-market segment (low-high)	Product-market	""	Website	1-3

[1] Segments: wood, pottery, stone, paper and plastic, wickerwork, leather, silverware and metal. [2] Small independent firms, silent partners, subsidiaries of national firms, subsidiaries of multinational firms. [3] Basic, primary incomplete, primary complete, secondary incomplete, secondary complete, higher education, university.

Sampling was time consuming, due to the absence of reliable databases. In order to enable sampling, databases have been compiled based on extensive web searches, exhibitor lists of trade fairs, membership lists of business associations, lists provided by ministries and city councils, and interviews with experts and non-firm actors. These databases have subsequently been cleaned by deleting firms that were no longer exporting crafts and/or have moved out of the study area. Based on the developed databases, survey samples have been stratified by product segment, firm size and roles in international trade (supplier and trader). During the interviews it became apparent that small, informal firms producing for exporters were excluded from the various sources that were reviewed. These firms have subsequently been included through snowball sampling. Small, informal firms were added to the sample until no new varieties of answers were found. In Yiwu, furthermore, the stratified sample of 117 firms resulted in only a very small number of respondents which scored high on product innovation. Therefore, 11 additional firms which were identified as most innovative by local government experts, were deliberately added to the sample. Due to the combination of sampling techniques and the lack of reliable databases, the selected samples do not equally represent firms in each case study: the samples tend to slightly over-represent innovative firms and under-represent small subcontractors. However, the sampling method ensures that the full variety of firms is included. This enables an analysis of differences within and between case studies. The non-response rate was 2.8 percent.

After data collection, the internal validity of the data has been checked in three ways. First, survey results were compared with observations and the firms' websites. As a result, ten respondents have been removed, as their responses proved to be unreliable. A few other respondents with unexpected responses have been called by phone, in order to countercheck their responses. Subsequently, the data from various sources and respondents was triangulated. This involves a non-linear process of comparing statistical findings, qualitative findings and secondary data. Thirdly, statistical data was checked on normality, outliers and multicollinearity. The robustness of the models was improved by trimming 12 outliers. These outliers were studied in greater detail, as outliers may represent firm agency: these firms may have opted to employ innovation processes and/or outcomes that differ from the mainstream.

Relatively rich qualitative data was collected through semi-structured interviews, observation and from secondary data. The data enables an explanation of the mechanisms leading to innovation, the role of non-firm actors in innovation processes and the evolutionary processes. Semi-structured interviews have been

conducted with firms and non-firm actors (see table 3.7). Among non-firm actors, a maximum variation sample was targeted, as research highlights the shared responsibility and influence of multiple stakeholders in innovation systems. The actors are local government, Chambers of Commerce, financial institutes, business associations, business development services, research institutes and universities. Within each actor, a key expert on handicraft export has been identified. Furthermore, entrepreneurs with expert knowledge on (the history of) handicraft exports have been targeted through snowball sampling. Snowball sampling started from various angles in order to reduce the community bias: respondents have been selected based on secondary data, such as academic publications, Internet and newspaper articles, and have been recommended by firm and non-firm actors. In addition, during the visit to their firm, survey respondents have volunteered in-depth information and/or recommended experts to be interviewed. Reliability of the qualitative sample is furthered by data triangulation with survey results, secondary data, on-site observations and website searches. The checklist for semi-structured interviews is in annex 2.

Table 3.7 Number of respondents

	Survey (firms)	Semi-structured interviews
Yiwu, China	118	19
Yogyakarta, Indonesia	100	41
Cape Town, South Africa	83	23
Total	301	83

3.5 DATA ANALYSIS METHODS

The study has conducted comparative qualitative analyses, combining three data analysis methods in order to do justice to the mixed dataset: co-variance analysis, qualitative analysis and fuzzy-set analysis. The case studies adopt different (combinations of) data analysis methods.

The Yogyakarta case study applies a co-variance and qualitative method in order to appreciate if and how absorptive capacity mediates the roles of global value chains and local innovation systems. The chapter first of all developed composite variables for absorptive capacity, local innovation systems and global value chains

based on factor analyses. Standard methods of performing factor analysis (i.e., those based on a matrix of Pearson correlations) assume that the variables are continuous and follow a multivariate normal distribution. If the model includes variables that are dichotomous or ordinal, a factor analysis can be performed using a polychoric correlation matrix. The analysis is conducted using Stata 13. For global value chains I constructed a factor from 3 indicators, for the local innovation system from 10 indicators, and for absorptive capacity from 12 indicators (annex 5).

The impact of independent and intermediate factors on innovation outcomes is analysed in regression analyses. The overall level of innovation and product innovation are categorical variables and they are estimated in ordered probit regressions. Process innovation, as a binary variable, is estimated in binominal logit regressions. The explanatory power of the models (R^2) in ordered and probit regressions appears to be relatively low. However, R^2-tests are not as useful as those in linear regressions and their interpretation is not straightforward. I find that the results of the models are comparable to other ordered and binominal logit regressions (Arampatzia *et al*. 2015; Norušis, 2011: 62; Williams 2006). The mediating role of absorptive capacity has been assessed using the approach of Baron and Kenny (1986). This approach is criticised and more fine-grained mediation techniques are available. However, the approach is preferred considering its wide application and the relatively small dataset at my disposal (Preacher *et al*., 2007).

Qualitative data was analysed by coding, grouping and regrouping data in ATLAS-ti. The codes reflect the variables and indicators that are used in the study. New codes have been added, as new factors were identified. In the analysis, initial patterns never fully matched the theory and/or the findings from the quantitative data. New explanations needed to be considered by engaging in new literature reviews, re-checking the validity of the data, regrouping qualitative data, conducting additional quantitative tests, etcetera.

The Cape Town case study, which assesses the impact of segmented business systems on innovation, also combines co-variational and qualitative analysis as described above. The segmentation of the business and innovation systems in Cape Town were statistically analysed using a TwoStep cluster analysis. The advantage is that the cluster analysis identifies the factors segmenting the business system. The cluster quality proved to be strong. The internal coherence and external variance of the segments of the business system were assessed using an ANOVA variance analysis. In order to check for counterarguments, a cluster analysis was run, using different indicators: captive versus relational global value chains; exporters versus subcontractors; different levels of capacity; and black versus

white entrepreneurs. Statistical analyses were controlled for firm and entrepreneurial characteristics and subsector. The study controls for differences in education based on firm-level competences.

In addition, evolutionary patterns are identified based on time series. The research first describes the chronologies of institutional regimes and innovation outcomes based on semi-structured interviews and secondary data. Specific time intervals are detected by analysing when innovation outcomes changed radically. Subsequently, the causes of change were traced. Secondary data from various sources was included in the time series analysis, in order to increase the internal validity.

The Yiwu case study and the comparative analysis have not conducted a cluster analysis, but have used a fuzzy-set analysis instead. Fuzzy-set analysis is a form of a qualitative comparative analysis, which transforms complex cases into specific configurations, enabling systemic cross-case comparison (Rihoux, 2013). Within configurations, institutions co-exist and accelerate or mediate the impact of individual institutions on innovation. The impact of individual institutions therefore depends on their institutional context (Blatter and Blume, 2008).

Fuzzy-set analysis aims to overcome the challenge that the relationship between the institutions and actors within institutional regimes is non-linear and their causality is not symmetric (Fiss, 2007; Kvist, 2007; Rihoux, 2013; Schneider *et al.*, 2010). A 'fuzzy-set ideal type' methodology is a superior way to compare case studies and compare the Yiwu case study to an ideal type institutional regime, because it allows for 'a precise operationalisation of theoretical concepts, the configuration of concepts into ideal types, and the categorisation of cases' (Kvist, 2007: 474). It also combines quantitative and qualitative data in a sophisticated way by calibrating the data. Ideal types are suitable for configurational comparative analysis, because they describe specific configurations of concepts from the perspective of one or a few points of view (Kvist, 2007: 479). The analysis has three steps. The first step is to categorise and operationalise the theoretical concepts as concretely as possible, whereby ideal types and truth tables are developed. This has been done in section 2.5.4 and table 2.2 respectively. Table 2.2, the truth table, can be further detailed with the indicators described in the previous section. The second step is to measure the indicators for each case study, and the final step is to score and calibrate the case study's membership of ideal types, which places case studies within theoretical perspectives using the ideal types as yardsticks (Kvist, 2007). This comparison to theoretical constructs eases theoretical generalisations.

3.6 RESEARCH PHASES

The research started off with a literature review, which culminated in a PhD proposal and a theory review. Also, a case study protocol was developed for a pilot study in Cape Town. Following the pilot study, the case study protocol, survey and semi-structured interviews were adjusted. Subsequently, the first case study was conducted in Yogyakarta, followed by analysis, report writing, the submission of an article and the elaborate review process. During the review process, the case study on Cape Town was conducted, followed by analysis, report writing, submission of the article and the review process. Subsequently the last case study was conducted in Yiwu. While the review processes of the case studies were still on-going, a comparative analysis was conducted and writing of the final report commenced.

During the process, regular feedback was offered from various sources, including the supervisor, presentation sessions, local researchers, colleagues, and reviewers of periodicals. Previous versions of chapters have been published during the process, each of which coincided with peer review. In particular, working papers have been published on the Yogyakarta and Cape Town case studies. A previous version of the Yogyakarta paper has been published by a conference and has, in a revised form, been published as a chapter in a peer-reviewed book. The earlier versions of the Cape Town chapter and the comparative analysis have also been published in peer-reviewed books. The case studies on Yogyakarta and Cape Town have been published as articles as well. The feedback has had a major impact on the research process and outcomes.

3.7 VALIDITY AND RELIABILITY

This section considers the construct validity, internal and external validity and the reliability of the study results.

Construct validity entails a clear and effective research design, whereby research questions and theoretical concepts are operationalised based on literature (Yin, 2009 and 2012). Where possible, I applied indicators that were used successfully in other studies. However, as the study applies theories to another context, indicators were adjusted and tested during the pilot study. The use of multiple data sources generates appropriate evidence and enables data triangulation.

Internal validity is constructed by acknowledging other possible rival theories and causal factors (Yin, 2009). A deductive research approach has been selected, whereby a wide range of contextual data has been collected. As discussed in

section 3.2, the inclusion of external factors is one of the main strengths of the study.

The internal validity is furthered by counterchecking the collected data. After all, respondents and the research subjectively interpret events, and especially recall data may be subjective and partially interpretations of the past. Secondary data drawn from homogeneous sources may weaken internal validity, especially if reports from key respondents suffer from the same bias as primary data. The research enhances objectivity of the data by collecting secondary data from a wide variety of sources, including websites, academic journals, newspapers and annual reports. The study also assesses the internal consistency of each interview and survey based on data triangulation. Research results are compared with observations during the survey and semi-structured interviews, the actors' websites, other survey and interviews responses and secondary data. A few responses were inconsistent. For instance, respondents claim a high level of innovation, while all indicators point towards a low level of innovation. Two respondents during the survey in Yiwu claimed the same product innovation. I continued asking questions and ended up deleting the invalid response. The responses of a research centre in Yogyakarta were nullified as well: it claimed a huge success in supporting craft firms, while none of the firms valued its importance.

Case study research is associated with weak external validity, since findings are not generalizable to a wider setting. Therefore, I cannot generalise research findings statistically beyond the case studies. This study limitation is partially overcome by targeting the research towards specific theories, enabling analytical generalisations. Case-specific findings are used to reflect on theories, which are by definition not case specific. The unique case study findings therefore potentially falsify theories and explore new (combinations of) theories.

Reliability assesses if another researcher would have arrived at similar conclusions (Thiel, 2014). This assessment is especially challenging in dynamic environments in emerging economies, as a renewed study at a later moment is likely to arrive at different results. The research constructs reliability by developing a transparent description of the case study approach and methodology. This includes detailed case study protocols. The description of the approach and methodology is offered in this particular chapter. Case study protocols have been developed for each case study. Furthermore, case study databases have been developed, comprising the case study protocols, quantitative data in SPSS, quantitative data in ATLAS-ti, secondary data in PDF formats and draft reports.

4 ABSORPTIVE CAPACITY AS A MEDIATOR: INNOVATION OF HANDICRAFT EXPORTS IN YOGYAKARTA, INDONESIA

PUBLICATION DETAILS

Fransen, J. and A.H.J. Helmsing (2016) 'Absorptive capacity as a mediator: innovation of handicraft exports in Yogyakarta, Indonesia', Tijdschrift van Economische en Sociale Geografie: details forthcoming. DOI: 10.1111/tesg.12212 (online version available, awaiting printing).

The article has been slightly adjusted in order to integrate it more logically into the structure of the thesis. Section 4.1 (introduction) adds a first paragraph and includes small edits in order to improve readability. Section 4.3 (research methods) adds a paragraph to relate the indicators of this chapter to those presented in section 3.3 (operationalisation). Section 4.7 (conclusions) adds a first sentence and minor editing in the first paragraph, as well as a new last paragraph.

RELATED PUBLICATIONS

Fransen, J. and E. van Tuyl (2017) 'Promoting cluster development, Kasongan pottery cluster, Yogyakarta, Indonesia', in: L. Carvalho, L. van den Berg, H. Galal and P. Teunisse (eds.). Delivering Sustainable Competitiveness. Revisiting the organising capacity of cities. Abingdon: Routledge. P.76.

Fransen J. and P.H.L. Gaul (2016) 'Absorptive Capacity and Local Networking of Home-Based Enterprises in 'Kampong Cyber', Yogyakarta, Indonesia', in: G.M. Gomez and P. Knorringa (eds.). Local Governance, Economic Development and Institutions. Springer.

Fransen, J and A.H.J. Helmsing (2013) 'Innovation of Exporting SME's in home accessories in Yogyakarta, Indonesia', Paper presented at the International Conference on Indonesia Development. The Innovation Driven Economy as the Fundamental of Indonesian Economic Growth, 12-14 September 2013. Held at ISS/EUR. 25 pp.

Fransen, J. (2013) 'Innovation in SMEs. The case of home accessories in Yogyakarta, Indonesia', IHS Working Papers 27. Rotterdam: IHS.

ABSTRACT

Innovation processes in emerging economies tend to differ from those in developed countries in that a larger share of firms absorb existing knowledge. The article assesses how firms' absorptive capacity mediates the impact of global value chains on the innovation of handicraft exports in Yogyakarta, Indonesia. The study draws three conclusions. First, the incremental innovation of craft exporters demands specific but rather mundane absorptive capacities of firms, such as language abilities and capable departments. Second, and contrary to what might be expected, the study finds that the governance modes of global value chains do not significantly affect the level of innovation. Third, a group of traders have the highest level of innovation, the highest level of absorptive capacity, and they positively affect the innovation of suppliers. Overall, the findings show that knowledge diffusion is furthered within an emerging local innovation system.

Key words: incremental innovation, absorptive capacity, local innovation systems, global value chains, Indonesia, emerging economies.

4.1 INTRODUCTION

This chapter presents the research findings on the first case study, which was conducted in Yogyakarta. In line with the exploratory multiple case study strategy, the chapter raises a specific research question that explains incremental innovation within Yogyakarta's institutional context. The question is: (how) does absorptive capacity mediate the impact of global value chains and local innovation systems on innovation in emerging economies? The chapter adopts an innovation system perspective, as discussed in section 2.2. The other two perspectives and the exploratory model, as discussed in sections 2.2 to 2.5, only become relevant in the subsequent case studies. Chapter 7, the comparative analysis, includes additional data on Yogyakarta in order to answer the thesis' main research question in full.

Two contrasting theories within the innovation system perspective claim to explain incremental innovation in emerging economies. Theory on global value chains stipulates that innovation in emerging economies is driven by lead firms that transfer knowledge to their suppliers in emerging economies. By contrast,

theory on local innovation systems states that innovation is primarily a local process in which geographical proximity matters. A growing body of literature has sought to establish how these two concepts co-relate, as exporting firms in emerging economies operate in both global value chains and local innovation systems (Altenburg *et al.,* 2008; Asheim and Isaksen, 2002; Belussi and Sedita, 2012; Chaminade and Vang, 2008; Criscuolo and Narula, 2008; Ernst and Kim, 2002; Fu *et al,.* 2011; Giuliani, 2005 and 2011; Humphrey and Schmitz, 2002; Lundvall *et al.,* 2010; Pietrobelli and Rabellotti, 2011; Sturgeon *et al.,* 2008; Vang and Asheim, 2006).

We introduce the concept 'absorptive capacity' (Cohen and Levinthal, 1990) to this emerging research field. Absorptive capacity is a firm-level capacity defined as 'a dynamic capability pertaining to knowledge creation and utilization that enhances a firm's ability to gain and sustain a competitive advantage' (Zahra and George, 2002: 185). Adding absorptive capacity to this research field is important because most exporting firms in emerging economies innovate by absorbing existing knowledge (Pietrobelli and Rabellotti, 2011).

We expect that absorptive capacity mediates the impact of global and/or local knowledge on innovation because innovation demands considerable capacity within firms. Nevertheless, what specific absorptive capacity is required and how this absorptive capacity mediates global and/or local knowledge in emerging economies remain unclear in the literature. The study focuses on incremental innovations, which are marginal and continuous adjustments to existing products, production processes, organizational structures and/or marketing instruments (Fagerberg, 2005). We define innovation in the tradition of Schumpeter as an entrepreneurial process to develop and improve products, processes and markets, with the aim of aggregating value (Marins, 2008: 13). Generally speaking, innovation studies have focused on radical, cutting-edge innovations, whereas incremental innovations have received relatively limited attention. Incremental innovations are nevertheless common in emerging economies (Pietrobelli and Rabellotti, 2011). Although most incremental innovations are not cutting edge, they do create flexibility and/or aggregate value in volatile global markets, and they contribute to competence building, the flip side of the innovation coin (Lundvall *et al*., 2010). Such innovation processes also emanate from low-tech sectors (Lundvall *et al.*, 2002).

We empirically study handicraft exports in Yogyakarta. Handicraft firms are small- and medium-scale enterprises producing pottery, wooden masks, wooden batik, silverware, baskets, small furniture and statues. Global buyers, such as *IKEA*, *Anthropology* and *Zara Homes*, lead innovation processes of handicraft firms because they control brand names and provide the link between suppliers in

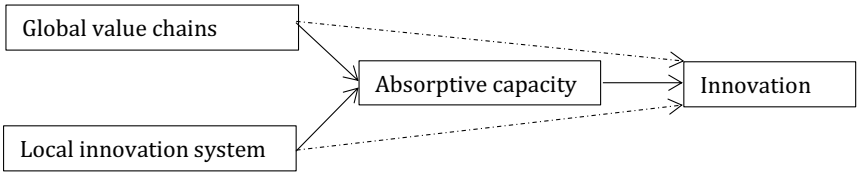
emerging economies and (western) consumers. However, local innovation systems are growing in importance, as the market offers a premium on ethnic designs. The handicraft industry in Yogyakarta is an age-old industry. Moreover, the industry is clustered, whereby different regions specialize in specific products, and traders link small clustered firms to global markets.

The article is structured as follows. We will first introduce the concepts, then describe the research methodology and subsequently report on the main research findings. The discussion section then highlights the main academic contributions, and the final section offers conclusions and outlines a research agenda.

4.2 THEORY

The literature on global value chains states that international lead firms affect the innovation of suppliers in emerging economies (Gereffi *et al. 2005*), whereas theory on local innovation systems claims that local knowledge exchange enables innovation at low transaction costs (Lundvall, 2007). We argue that firms' absorptive capacity functions as a mediator, to the extent that it accounts for the impact of global value chains and/or local innovation systems on innovation (see figure 4.1).

Figure 4.1 The mediating role of absorptive capacity



Exporting firms in emerging economies tend to acquire knowledge from global value chains, defined as the full range of activities required to bring a product or service from conception to final customers and disposal after use. In buyer-driven global value chains, such as that for handicrafts, global buyers dominate the chain through branding, marketing and product design. By contrast, supply-driven global value chains are led by large manufacturers (Kaplinsky and Morris, 2000). We limit our study to buyer-driven value chains. While knowledge from global value chains can enable sustained and systemic innovation by firms in emerging economies, the

knowledge transfer process is far from automatic (Lall, 2003), as it depends on the roles of firms and modes of governance in global value chains.

We specifically focus on three roles that are common in buyer-driven value chains: global buyers, traders and suppliers. Global buyers tend to be the 'lead firms'. They are wholesalers that manage brands and set and control standards, often without producing themselves (Saliola and Zanfei, 2009: 371). Global buyers prefer to work with a limited number of traders with relatively high levels of competences. As traders have direct contact with global buyers, they can absorb international knowledge directly, adding to the territorial pool of knowledge (Criscuolo and Narula, 2008; Saliola and Zanfei, 2009). Traders' ability to absorb knowledge, however, depends on their knowledge gap with global buyers, who tend to have higher capacities (Humphrey and Schmitz 2002). Suppliers operate downstream in global value chains and tend to have lower competences. Therefore, they acquire knowledge that is filtered by suppliers and offered at a time lag. Consequently, suppliers are in a poorer position to absorb knowledge from global value chains than traders.

Opportunities to innovate also depend on the modes of governance of global value chains. This study focuses on two modes of governance found in our case study. First, captive global value chains are expected to restrict opportunities to innovate. Global buyers may actively support the innovation of suppliers in nonstrategic areas, especially production processes, but they are likely to block-innovations in strategic areas, such as branding, design and marketing (Altenburg *et al.* 2008). Suppliers' absorptive capacities are likely to be biased toward production processes to enable them to produce efficiently at specified international standards of production. Second, relational global value chains provide broader innovation opportunities, as traders and/or suppliers can acquire knowledge from a range of global buyers in reciprocal relationships (Gereffi *et al.* 2005). Their level of innovation depends on broader absorptive capacities, which enable local firms to constantly adjust their products, processes and markets to reposition themselves within global markets (Dutrénit 2004 and 2007). Other modes of governance are arm's-length, hierarchical and modular global value chains (Gereffi *et al., 2005).*

A local innovation system, by contrast, enables systemic and sustained innovation within physical proximity. In this regard, economic coordination and knowledge exchange through nonmarket relationships fosters systemic and sustained innovation (Humphrey and Schmitz 2002). However, these relationships are not always fully developed. In many territories in emerging economies, the local innovation system, at best, allows exporting firms to produce at international market standards, while local knowledge exchange is generally rare. A local

innovation system is emerging if and when local knowledge exchange starts playing a more prominent role (Chaminade and Vang, 2008). Such an innovation system enables the combination of global and local knowledge (Criscuolo and Narula, 2008), and knowledge diffusion from firms operating within global value chains to other local firms (Chaminade and Vang, 2008). 'Technological gatekeepers', which are firms with a relatively high level of absorptive capacity that acquire knowledge beyond their locality (Giuliani 2011), can be instrumental in linking global value chains to local innovation systems. They often lead local value chains, linking global buyers to suppliers with lower levels of absorptive capacity at the bottom of global value chains (Chiaversio *et al.* 2010: 334). Knowledge from global value chains diffuses down the value chain and spills over to other local firms through observation, copying, labor market mobility, clustering and communities of practice (Belussi and Sedita 2012; Giuliani 2005 and 2011). In this regard, trust and reciprocity among local actors may facilitate reciprocal knowledge exchange, and non-firm actors can support knowledge diffusion with knowledge-intensive business development services, cluster support, elaborate appropriation regimes and applied research (Pietrobelli and Rabellotti 2011).

Absorptive capacity is expected to mediate the impact of global value chains and/or local innovation systems on innovation. By decomposing absorptive capacity into four stages, we can study its mediating role and the competences required in buyer-driven global value chains in emerging economies. First, firms should be able to identify and acquire the knowledge from global value chains and local innovation systems that is critical to their operations (Zahra and George 2002: 189). Firms face the challenge of filtering an almost endless amount of knowledge to select the knowledge that is relevant for their specific market segment and routines (Acs and Plummer 2005). Once such knowledge is acquired, it should be analyzed, processed, interpreted and understood. This process is facilitated by internal communication and capable staff (Zahra and George 2002: 189). Firms subsequently transform their method of operation by creating new combinations of knowledge (Zahra and George 2002: 190). If firms are able and willing to invest resources and manage and plan these developmental processes, then such combinations of knowledge result in adjusted products, markets and/or processes. Finally, firms must exploit the transformed knowledge by being able to sell innovative products in (new) market niches at competitive prices. Only a tiny portion of the knowledge available in global value chains and local innovation systems is likely to be realized as innovations (Acs and Plummer 2005).

Exporting firms need a relatively high level of absorptive capacity to produce at the standards of international markets, particularly if they want to produce incremental innovations. With higher absorptive capacity, firms can more easily appreciate the value of new knowledge and act accordingly. Dutrénit (2004)

describes the various levels of absorptive capacity of latecomer firms. At a minimum, firms should be able to reduce costs and improve quality by imitating technologies based on the accumulation of productive capabilities (Chaminade and Vang 2008; Dutrénit, 2004). In a transition stage, firms accumulate production capabilities and intermediate innovative capabilities, but these capabilities are still unbalanced. During this stage, firms incrementally innovate products, processes and/or markets, but they cannot yet strategically position themselves in markets. With an advanced level of absorptive capacity, firms can strategically position themselves in competitive markets, and they may pioneer new products, processes and/or markets based on their innovative capabilities (Dutrénit 2004).

We conclude that theory implicitly assumes that absorptive capacity plays a mediating role in incremental innovation processes in emerging economies, as firms are able to innovate only to the extent that they are able to appreciate and apply knowledge acquired from global value chains and/or local innovation systems. A more explicit understanding of the mediating role of absorptive capacity will therefore help elucidate the incremental innovation processes in emerging economies.

4.3 RESEARCH METHODS

The concepts described above have been operationalized for a study on craft exporters in Yogyakarta (table 4.1). The dependent variable is the perceived innovation level. The Oslo manual of the OECD (2005) recommends various subjective indicators, as other indicators tend to exclude incremental innovations (Marins 2008). To increase the internal validity of the study and reduce a risk of endogeneity, we have correlated the perceived innovation level with specific types of innovation performed by craft firms in Indonesia, as identified by Geenhuizen and Indarti (2010). We find that the perceived innovation level significantly correlates with the newness of craft products; an increase in the number of buyers, the number of products and product quality; improvements in the quality of staff; and cost reductions.

The independent variables are the local innovation system and global value chain, whereby the local extension of the value chain is treated as part of the local innovation system. We focus on two roles in global value chains: traders and suppliers (there are no global buyers located in Yogyakarta). The modes of value chain governance are defined based on the transactional dependence on the main client, and the strength of knowledge interaction is based on the perceived importance of global buyers in innovation processes. Further, the local innovation

system is measured based on its emergence, the perceived importance of local actors in innovation and knowledge spillover. The mediator is absorptive capacity. The indicators acquired from the literature are adjusted to the case study and are based on a pilot study and secondary data from Indonesia (Brata 2009 and 2011; Geenhuizen and Indarti 2010; Indarti 2010; Ismalina 2011). Some indicators proved irrelevant (such as joint research teams, cross-departmental teams, job rotation and formalization of procedures), and others required adjustment. Firm and entrepreneurial characteristics function as control variables.

In accordance with the specific research question raised in this chapter, the other variables of the exploratory model, as discussed in section 2.5, are not operationalised in this chapter. These variables are the business system, firm strategies, path dependence and path renewal. The main indicator of incremental innovation, as noted above, is its perceiced overall level. The levels of product and process innovation have been measured as well, but they were irrelevant for this particular chapter. The local innovation system includes an additional indicator on its strength of emergence.

Quantitative data are collected in a survey of 100 firms (traders and suppliers) based on random sampling (table 4.2). The sample comprises approximately 55 percent of all firms and is drawn from a database of the Department of Trade and Industry in Yogyakarta. A few firms subcontract to small, informal firms not listed on the database and these subcontractors have been added to the list. We visited each firm personally and interviewed the CEO. Because they did not complete all the questions, 7 to 13 percent of the respondents are excluded from the regression models. Excluding these participants does not affect the results, as their scores for the main indicators do not significantly differ from those of other respondents. Due to the small sample size and the subjective dependent variable, the results should be interpreted with care.

Table 4. 1 Overview of indicators

Variables	Indicators	Source	Scale	Key references
DEPENDENT				
Innovation	Perception of innovation	Survey	1-5	Marins, 2008;
	Newness of products	""	1-4	OECD, 2005
	Cost reductions	""	1-5	
	Quality improvements product & staff	Qualitative		
	Increase number buyers & products	""		
	Observed innovations	""		

INDEPENDENT				
Global value chain	Knowledge from global buyers	Survey	1-5	Gereffi *et al.,* 2005;
	Quasi-hierarchical chains[2]	""	1-2	Humphrey and
	Roles: trader/supplier[3]	""	1-2	Schmitz, 2002
	Knowledge from trade fairs[1]	""	1-5	
Local innovation system	Knowledge exchange local actors [1,4]	""	1-5	Asheim and
	Perceived importance of observations	""	1-5	Isaksen, 2002;
	Location in geographical cluster	""	1-2	Lundvall, 2007;
	Spillovers: copying, labor mobility, observation	Qualitative		Pietrobelli and Rabellotti, 2011
	Strength of the emerging system [5]	""		
MEDIATOR				
Absorptive capacity	Acquire			
	Frequency of international travel	Survey	1-5	Flatten *et al,.* 2011;
	Language abilities	""	1-2	Jansen *et al.,* 2005;
	Previous position	""	1-3	Macpherson and
	Market knowledge	""	1-5	Holt, 2007
	Assimilate			
	Training	""	1-5	
	Internal communication	""	1-2	
	Number of departments	""	1-5	
	Staff capacity	""	1-5	
	Participation in decision making	Qualitative		
	Transform			
	Investments	Survey	1-2	
	Own finance of innovations	""	1-2	
	Business planning	""	1-2	
	Exploit: balancing innovations	""	1-5	
CONTROL				
Firm-level	Size: employment	Survey	1-400	Macpherson and
	Size: turn-over in US$1,000	""	2-5,000	Holt, 2007
	Age	""	2-59	
	Legal status[6]	""	1-4	
Sector-level	Market segments[7]	""	1-7	
	Product-market combination[9]	""	1-3	
Entrepreneur-level	Education[8]	""	1-6	
	Age	""	20-65	
	Gender	""	1-2	
	Risk-taking propensity	""	1-5	

Notes: The indicators included the survey are also measured qualitatively. [1] Measured as the perceived importance. This variable correlates with the question on daily, weekly, quarterly, yearly, or less frequent interactions. [2] Captive value chains depend on global buyers for at least 70% of sales; relational value chains, less than 70%. [3] Suppliers subcontract less than half of all products; traders, more than half of all products. [4] The local actors are traders, suppliers, chambers of commerce, business associations, cluster associations, government, universities and finance institutes. [5] Measured as the overall frequency of interactions; business development support, financial support, rules of appropriation, standard setting and control, level of trust, role of universities, R&D. [6] Small independent firms, silent partners, subsidiaries of national firms, subsidiaries of multinational firms. [7] Segments: wood, pottery, stone, paper and plastic, wickerwork, leather, silverware and metal. [8] Basic, primary incomplete, primary complete, secondary incomplete, secondary complete, higher education, university. [9] The segments are low, medium and high price quality combinations.

Composite indicators of the independent and mediating variables are constructed by using factor analyses (annex 1). The factor Absorptive Capacity categorizes firms at low, medium and high levels. The factor Global Value Chains also incorporates three categories: the first category includes suppliers with weak interactions with global buyers, the second includes suppliers and traders with medium strength interactions with global buyers, and the third category mainly includes traders with strong interactions in global value chains. The Factor Local Innovation System indicates the extent to which firms exchange knowledge with local actors and operate within a cluster. Given the categorical nature of our dependent variable, models are estimated by using ordered probit regressions. Robustness analyses in which other innovation indicators were used and the factors were replaced with individual indicators have been conducted.

Relatively rich qualitative data are collected through observations, web searches and semistructured interviews with 27 firms, 3 experts, 11 local non-firm actors and one global buyer. The qualitative data allow us to unravel the mechanisms through which absorptive capacity mediates the impact of global value chains and/or local innovation systems on innovation, and they provide a description of the emerging local innovation system. Data triangulation strengthens the internal validity of the study.

Table 4.2 Survey sample (numbers of firms)

	Wood	Pottery	Stone	Paper/plastic	Wickerwork	Leather	Silver/Metal	All	Total
Trader	6	2	2	1	2	2	4	12	31
Combination	2	5	1	0	0	2	0	1	11
Supplier	12	12	7	5	11	0	5	6	58
Total	20	19	10	6	13	4	9	19	100

4.4 MAIN FINDINGS

Handicraft exporters in Yogyakarta comprise about fifty traders and one hundred thirty small-scale suppliers. We find that traders are significantly more innovative than suppliers (table 4.3), confirming the results of other studies conducted in Yogyakarta (Brata 2009 and 2011; Indarti 2010) and the opinions of the Chamber

of Commerce and the Centre of Handicraft and Batik. At the lowest level of innovation, suppliers imitate the designs and production processes of global buyers and traders and/or follow designs and processes published on the Internet. Most suppliers and a few traders show an average level of innovation. Qualitative data reveal that they incrementally adapt available designs to new trends on a daily to monthly basis, adapt production processes to product designs and/or continuously source for new markets. With these practices, they introduce new designs one to four times a year. A few suppliers and most traders pioneer new products and production processes. Respondent #11, for instance, is a trader of exclusive bathroom equipment. His clients include the Sheikh of Abu Dhabi, and his innovations include a paperwork coating for bathroom equipment that is water and scratch resistant yet environmentally friendly. It took him 1½ years to develop this product. As with many other firms, he guards his designs by working with people he trusts, while only three firms have applied for patents to protect their innovations (table 4.3).

TABLE 4.3 DESCRIPTIVE STATISTICS

	Overall				Traders			Suppliers		
	Mean	Sd	Min	Max	Mean	Median	Sd	Mean	Median	Sd
Perceived innovation level	3.61	0.90	1	5	4.071	4	0.87	3.381	3	0.89
Factor absorptive capacity	2.00	0.87	1	3	2.821	3	0.39	1.631	1	0.77
Factor local innovation system	2.00	1.06	1	5	2.371	2	1.27	1.841	2	0.91
Factor global value chains	2.18	0.72	1	3	2.731	3	0.45	1.941	2	0.69
Patents	0.03	0.17	0	1	0.101	0	0.30	0.001	0	0.00
Firm age (years)	13.08	8.49	2	59	14.8	12	11.4	12.5	11	6.87
Observations	98									

[1] Values in the same row are significantly different at $p < 0.05$ in the two-sided test of equality for the column means. Cells without subscripts are not included in the test. The tests are adjusted for all pairwise comparisons within the row of the innermost subtable by using the Bonferroni correction.

The level of absorptive capacity also significantly differs between traders and suppliers (table 4.3). A robustness analysis reveals that the highest level of absorptive capacity is found among traders with international exposure, English language skills, a high education level, a departmental structure and the ability to

balance products, processes and market innovations. Other traders and a small group of larger suppliers with a departmental structure form a group with a somewhat lower level of absorptive capacity. Finally, small suppliers with a low level of education operating without a departmental structure have a low level of absorptive capacity, which is often skewed toward process innovation. These small suppliers face great difficulty in absorbing knowledge because they lack capacity in almost all the indicators of absorptive capacity.

Firms can adopt three different positions within a global value chain (table 4.3), and their position correlates with their level of absorptive capacity (table 4.4). Specifically, we find that most traders and a few suppliers strongly interact with global buyers and have a high level of absorptive capacity, a second group comprises suppliers and a few traders who mainly exchange knowledge with local traders and occasionally contact global buyers directly, and a third group comprises suppliers with a relatively low level of knowledge exchange within global value chains. The level of absorptive capacity is relatively weak in this last group, and the qualitative data reveal that they export products only occasionally, as they are called in when the other traders and suppliers have order overflows.

The integration of firms within the local innovation system ranges from firms operating more or less in isolation to firms with deep ties of association (table 4.3). In this regard, local integration significantly correlates with integration into global value chains and absorptive capacity (table 4.4). A small group of suppliers are weakly integrated into global value chains and the local innovation system and they have a low level of absorptive capacity. By contrast, a small group of traders are deeply integrated and have a high level of absorptive capacity. Other traders and suppliers operate within these two extremes.

The local innovation system is emerging, whereby local knowledge exchange is valued significantly less than knowledge exchange with global buyers. The qualitative analysis enables a somewhat deeper description of the local innovation system. The local government (particularly enterprise development branches within Yogyakarta), research institutes and business associations provide firms with information, training and subsidies to attend trade fairs. However, the local government is considered to be weak in training, bureaucratic and inefficient (Respondents #3, 10, 11, 13, 16). Moreover, business associations are perceived to collude with governments for the benefit of their active members (Respondents #2, 6, 8, 9, 10, 11, 13, 14, 25, 32; Indarti 2010; Shima *et al.* 2006), and the government does not provide research incentives to firms but instead directly funds research of the ineffective Association of Handicraft and Batik (Ismalina 2011). The rules of appropriation within the sector are also weak, resulting in widespread illegal copying. By contrast, standard setting is relatively strong.

Table 4.4 Pearson correlations between predictor variables

	1	2	3	4	5
1 Factor absorptive capacity		.272**	.552**	.214*	.071
2 Factor local innovation system			.392**	-.056	.128
3 Factor global value chain				.119	.078
4 Patents					.025
5 Firm age (years)					

* p < 0.05 level (2-tailed), **p < 0.01 level (2-tailed).

Using the methodology of Baron and Kenny (1986), we find that absorptive capacity significantly mediates the impact of global value chains on innovation. This finding is supported by four regression models (table 4.5). The table reports on the coefficients and the marginal effects. Detailed marginal effects are presented in annex 4. Model *a* includes global value chains and the local innovation system but excludes absorptive capacity. In this model, firms integrated into global value chains are more likely to be highly innovative, while the impact of integration into the local innovation system is likely to be nonsignificant. Furthermore, chances of being innovative increase if firms apply for patents and if they are younger. Model *b* subsequently controls for absorptive capacity in the regression (table 4.5). In this model, only absorptive capacity and the control variable 'firm age' are likely to affect innovation. A higher level of absorptive capacity increases chances of reporting a very high level of innovation. By contrast, the impact of global value chains becomes nonsignificant, implying that its impact is indirect. Model *b* is also considerably stronger than model *a*, as can be deduced from the superior scores for Prob > chi^2 and McFadden's pseudo R^2. This result strengthens the notion that absorptive capacity mediates the impact of global value chains on innovation.

To test whether the conditions for mediation are met, we assess whether global value chains affect innovation via absorptive capacity. This analysis is performed in two steps. Model *c* first regresses absorptive capacity on global value chains and local innovation systems. Subsequently, model *d* regresses innovation on absorptive capacity while excluding global value chains and the local innovation system (table 4.5). We find that both conditions are met. Specifically, model *c* reveals that a better integration into global value chains and patenting significantly increase chances of a high level of absorptive capacity. Model *d* shows that absorptive capacity and firm age are likely to affect innovation directly.

To test whether the models are robust, we replace the factors of absorptive capacity, global value chains and the local innovation system with their indicators, and the indicator of the dependent variable with a factor of innovation. We find that these models yield similar results. The robustness analyses of model *a* and *c* reveal that roles of firms in global value chains matter, whereas modes of governance do not significantly affect innovation and absorptive capacity. The robustness analysis of model *b* reveals which absorptive capacities significantly influence innovation. Specifically, the language abilities and previous position of entrepreneurs, departmental structure, staff training, employment of capable designers and the ability to balance products, processes and market innovations mediate the impact of global value chains on innovation.

Table 4.5 Regression models to test the mediating role of absorptive capacity

	(a) Innovation level		*(b)* Innovation level		*(c)* Absorptive capacity		*(d)* Innovation level	
	β	M.E.[1]	*β*	M.E.[1]	*β*	M.E.[1]	*β*	M.E.[1]
Absorptive capacity			0.54*** (0.17)	0.101*** (0.03)			0.62*** (0.15)	0.116*** (0.0028)
Global value chain	0.41* (0.18)	0.086*** (0.04)	0.15 (0.20)	0.028 (0.002)	0.99*** (0.20)	0.269*** (0.043)		
Local innovation system	0.12 (0.12)	0.025 (0.026)	0.04 (0.13)	0.008 (0.002)	0.15 (0.12)	0.004 (0.033)		
Patents	1.53* (0.73)	0.323** (0.149)	1.25 (0.71)	0.234* (0.128)	5.62*** (0,29)	1.535*** (0.106)	1.23 (0.68)	0.231* (0.123)
Firm age	-0.03* (0.01)	-0.006* (0.003)	-0.02** (0.01)	-.007*** (0.003)	-0.02 (0.02)	0.005 (0.004)	-0.04** (0.01)	-0.007*** (0.003)
Observations	94		87		88		87	
Prob > chi[2]	0.0011		0.0001		0.0000		0.0000	
Pseudo R^2	0.0759		0.1285		0.201		0.1247	

(a) Regression of innovation level on the local innovation system and global value chain.
(*b)* Regression of innovation level on the local innovation system, global value chain and absorptive capacity.
(c) Regression of absorptive capacity on the local innovation system and global value chain.
(d) Regression of innovation level on absorptive capacity.
[1] Model a, b and d mention the marginal effects of a very high level of innovation in and model c of category 3 absorptive capacity. Robust standard errors are in parentheses.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

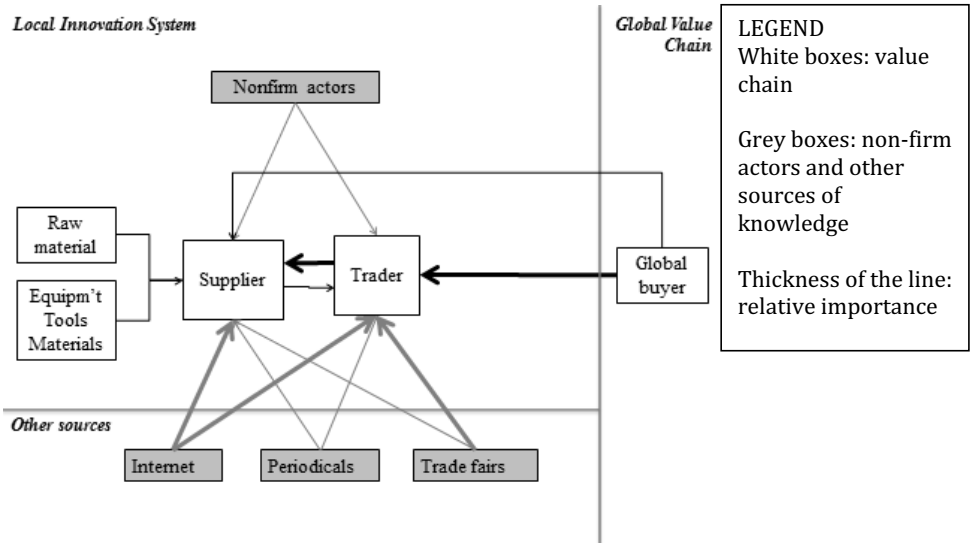
4.5 ABSORPTIVE CAPACITY AS A MEDIATOR

To better understand the mediating role of absorptive capacity, we analyze the stages of absorptive capacity as elaborated in the theory section. First, firms acquire and assimilate knowledge. Traders score significantly higher on these capacities and especially on language abilities, international travel of entrepreneurs, a departmental structure with a capable designer, staff training and staff participation. They use their capacity to acquire and assimilate knowledge on market and product trends from global buyers, which they combine with knowledge from trade fairs and the Internet (figure 4.2). In turn, suppliers mainly acquire and assimilate knowledge from traders and the Internet. Respondent #5, a trader, describes intense knowledge acquisition from global buyers and its representatives:

> 'Buyers are our most important partners because if we produce what they like, we will receive orders. They know the market demand. If buyers come here, they give us direction. We sit and discuss the collection (…). They also help improve quality. They have a representative for technical auditing. He visits us annually. (…) If we have a problem, we contact them'.

By contrast, knowledge from non-firm actors, such as local government and business associations, is considered to be of limited importance.

Figure 4.2 Knowledge exchange



We find that firms operating in a captive value chain are less able to acquire and assimilate knowledge than firms in relational global value chains; however, they are better able to transform and realize knowledge. Ultimately, the level of innovation is similar. The processes can be illustrated by an example of three suppliers within the captive global value chains of *IKEA* (see also Ivarsson and Alvstam 2010). Before cooperation commences, *IKEA* conducts business audits. Respondent #18 notes the following:

> 'When they [*IKEA*] were done, they knew more about my firm then I did. It was no longer my firm, but I learned a lot'.

Such support enables close collaboration. Local representatives visit the suppliers regularly for quality control purposes and support innovation processes. In addition, if necessary, they visit weekly or stay for extended periods of time to transform the firm and foster innovations.

Once the firms have acquired and assimilated knowledge, they transform the knowledge. In this regard, traders combine global knowledge on markets, designs and trends with local knowledge on 'ethnic designs', capabilities and production costs. Remarkably, the differences in transformation capabilities among firms do not significantly explain the variation in innovation, as traders need suppliers to develop designs and produce items to scale and therefore use their transformative capabilities to build the competences of suppliers. Competence building takes place on the job. Most innovations start when global buyers present general design concepts and market trends to traders, and traders and suppliers subsequently prepare product samples together, combining the global knowledge that traders have acquired with the traditional skills and knowledge of the suppliers. At this stage, knowledge exchange is reciprocal, as indicated by the relationship between a trader (Respondent #7) and three suppliers (Respondents #21, 21, 22). These respondents have known each other for decades and live, and they work in the same neighborhood. Respondent #7 is a respected designer, and all suppliers prefer working with him. When he cannot offer work, he assists his suppliers in designing products for other traders or the local market. The processes of 'Out of Asia' demonstrate how support slowly establishes the competences of suppliers, as indicated by Respondent #3:

> 'When Out of Asia introduces a new design, the community [suppliers] says that they cannot produce it. They then work patiently with the community until they can. This is a painstaking process of trial and error'.

Knowledge subsequently diffuses to other firms within the emerging local innovation system. As Respondent #5 notes,

> 'If I want to know what is happening, I talk to my suppliers. They know what my competitors are doing'.

Respondent #5 brought us to one of his suppliers, who was producing items for another exporter at the time. This work included labelling products with the design and name of the buyer in the open for all visitors to see. Designs and clients are unlikely to be kept secret in such an environment. Indeed, knowledge travels particularly quickly in communities of practice and clusters. All firms in clusters are members of business associations, where knowledge of products and processes is widely exchanged (Ismalina 2011). In addition, knowledge spills over via observations and staff mobility.

Stage four of absorptive capacity encompasses firms' ability to realize innovations by balancing and implementing products, processes and market innovations. A relatively large group of firms have shown capabilities in absorbing, assimilating and transforming knowledge, which are enabled by knowledge diffusion; however, only a small group of traders and a few suppliers are able to exploit the accumulated and transformed knowledge.

4.6 Discussion

The study shows how absorptive capacity mediates the impact of buyer-driven global value chains on the incremental innovation of craft exporters in Yogyakarta. While the results of the study cannot be generalized, they nevertheless provide insight into the mediating role of absorptive capacity in the impact of linkages with global value chains and emerging local innovation systems on innovation. In this regard, five issues for discussion are notable.

First, we would like to discuss which specific absorptive capacities may stimulate incremental innovation in emerging economies. The study reveals that various intermediate innovative capabilities affect incremental innovation of craft exporters in Yogyakarta, indicating a transition stage of absorptive capacity. In particular, language abilities enable entrepreneurs to communicate more easily with global buyers, and the absorptive capacities of individual employees and departments within firms (i.e., capable departments, capable designers and trained staff) facilitate knowledge assimilation within firms. These findings may indicate that in addition to 'hard' competences, such as the number of engineers, 'soft' competences of exporting firms may affect incremental innovation (Cohen and

Levinthal, 1990; Dutrénit, 2004; Zahra and George, 2002). In addition, we find that the ability to balance products, processes and market innovations enables firms to introduce new product innovations at competitive prices in international markets (Zahra and George, 2002). This enables craft exporters in Yogyakarta to strategically distinguish their firms competitively. More research is recommended in order to assess the specific absorptive capacities.

Second, we are surprised to find that the governance mode of global value chains does not significantly affect innovation in any of our regression models, as would be predicted by the global value chain literature (Gereffi *et al.*, 2005). In particular, the research findings show that firms operating in captive global value chains are as innovative as those in relational global value chains, and the qualitative analysis reveals that captive global value chains may generate fast learning curves for production processes and may foster the realization of innovations (Ivarsson and Alvstan 2010). The linkage between the governance modes of global value chains and the competences of firms is relatively well studied in the global value chain literature, but the levels and stages of absorptive capacity are generally not specified (Gereffi *et al.* 2005; Humphrey and Schmitz 2002; Sturgeon *et al.* 2008). These findings illustrate the need for further research on the mediating role of absorptive capacity in buyer-driven global value chains in emerging economies.

Third, the findings show that craft traders in Yogyakarta innovate by reconciling global and local knowledge. Global buyers offer knowledge on designs, trends and technologies, whereas local suppliers offer knowledge and skills on ethnic product design, production costs and capabilities. Traders then reconcile this complementary knowledge (Belussi and Sedita 2012; Fu *et al.* 2011), resulting in incremental innovations. The reconciliation process is highly pronounced in the case study, because global buyers value the ethnic designs of craft exporters in Yogyakarta. It demands more research to assess whether, when and how this reconciliation process may occur in buyer-driven global value chains in emerging economies.

Fourth, our research reiterates the importance of technological gatekeepers in innovation and knowledge diffusion (Giuliani 2011). We find that a group of capable traders links global value chains to an emerging local innovation system. This group of traders is both locally and globally connected, which facilitates knowledge acquisition and diffusion. As suppliers' level of absorptive capacity is rather low, traders spend considerable resources supporting 'their' suppliers. Therefore, our findings show anecdotally that the transformative capacity of technological gatekeepers (stage 3 of absorptive capacity) may increase suppliers' level of innovation. More research is needed to assess whether this is a generic phenomenon among technological gatekeepers.

Finally, we would like to briefly discuss the impact of emerging local innovation systems on innovation. The study shows that the embedding of craft exporters within the local innovation system is unlikely to influence their innovation. Instead, firms appear to depend on knowledge from outside the territory. However, we do not wish to argue that emerging local innovation systems are unimportant. On the contrary, they enable competence building, the reconciliation of global and local knowledge, and local knowledge diffusion. Based on anecdotal evidence, we find that clustering, ties of association, and communities of practice appear to facilitate knowledge reconciliation and diffusion within the territory (see also: Belussi and Sedita, 2012; Brata, 2011; Chaminade and Vang, 2008; Giuliani, 2005; Pietrobelli and Rabellotti, 2011). Arguably, the government policy that has contributed the most to competence building has been the opening up of export possibilities for SMEs. This policy, which is usually not associated with innovation policies, has attracted traders with a high level of absorptive capacity. We recommend more studies at a higher aggregate level and with a larger sample size, in order to analyse the role and evolution of emerging innovation systems.

4.7 Conclusions

In line with the exploratory multiple case study strategy of the thesis, this chapter raises a research question which relevant to this particular case study. The question is whether and how the absorptive capacity of firms mediates the impact of global value chains and local innovation systems on the innovation of handicraft exporters in Yogyakarta. It specifically relates to the innovation system perspective. Due to the small sample size and subjective dependent variable, the results should be interpreted with care. Our findings show that absorptive capacity mediates the impact of global value chains on incremental innovation, whereas the emerging local innovation system does not explain the variation in innovation among firms. These findings lead to the conclusion that absorptive capacity deserves more attention in studies on incremental innovation in emerging economies. By decomposing absorptive capacity into stages, we highlight the many, often mundane capacities that firms require. If these capacities vary widely between firms, then such variation is likely to explain differences in innovation.

Global value chains remain important in explaining innovation. The research findings show that by operating in global value chains, craft exporters in Yogyakarta can build up their level of absorptive capacity. Learning appears to take place in both relational and captive global value chains, whereby captive global value chains potentially offer a fast track to learn about production processes and international standards in international markets. Criscuolo and

Narula (2008) show that learning in global value chains may contribute to a higher aggregated level of absorptive capacity for a territory. Moving beyond the usual instruments of absorptive capacity building (i.e., education, training and business development services), our findings show that technological gatekeepers (Giuliani 2011) may increase the aggregate level of absorptive capacity as well, as they may bring up firms with lower levels of absorptive capacity. Furthermore, we find that an emerging local innovation system can facilitate this process through local knowledge diffusion.

We call for more research on the mediating role of absorptive capacity in incremental innovation in emerging economies. As our study is limited in scope, we recommend that research examine other buyer-driven global value chains in emerging economies and preferably use larger sample sizes. Some specific research questions have come to the fore: Does incremental innovation in other buyer-driven global value chains in emerging economies demand similar absorptive capacities? How and under what conditions can the reconciliation of global and local knowledge contribute to incremental innovations? (How) do traders and suppliers in emerging economies learn in captive global value chains? How and under what conditions do technological gatekeepers affect innovation? This study has shown that these conditions may include whether traders and suppliers are capable. More research is needed to validate the findings and better appreciate the factors that contribute to incremental innovation in emerging economies.

In summary, this case study relates to a small but important aspect of the exploratory model, as discussed in section 2.5: the linkage between innovation systems and the firms' absorptive capacities. It has contributed to the discussion on multilevel innovation systems in emerging economies. At this stage of the research, the importance of business systems and institutional path dependence has not yet been revealed. Those perspectives become important in the next case study on the innovation of craft exporters in Cape Town.

5 BREACHING THE BARRIERS: THE SEGMENTED BUSINESS AND INNOVATION SYSTEM OF HANDICRAFT EXPORTS IN CAPE TOWN

PUBLICATION DETAILS

Fransen, J. and A.H.J. Helmsing (2016) 'Breaching the barriers: the segmented business and innovation system of handicraft exports in Cape Town', Development Southern Africa 33(4): 486-501.

The article has been adjusted, in order to better align it to the structure of the thesis. Section 5.1 (introduction) adds a first paragraph and includes small edits in order to improve readability. Section 5.2.3 and table 5.1 (model of path dependent segmentation) have been aligned to the structure of the exploratory model, as described in section 2.5 and the indicators in section 3.2. Section 5.3 (method) adds a paragraph relating the indicators used in this chapter to those presented in section 3.2. Section 5.4 (findings) has been restructured in order to better align it to the revised model of path dependent segmentation. Section 5.5 (conclusions) adds a new first paragraph.

RELATED PUBLICATION

Fransen, J. (2012) 'Transições urbanas em desequilíbrio. De artesanatos a objetos de decoração na Cidade do Cabo = Unbalanced urban transitions. From handicrafts to home accessories in Cape Town', in: R. Cavallazzi and R. Cury Paraizo (eds) Patrimônio, ambiente e sociedade: novos desafios espaciais = Heritage, environment and society: new spatial challenges. Rio de Janeiro: Programa de pós-graduação em urbanismo (PROURB): 77-115, 275-304.

ABSTRACT

Twenty years after apartheid was formally abolished, black handicraft exporters in Cape Town still innovate significantly less than their white counterparts. This study explains these differences based on the segmentation of business and innovation systems, a novel approach that aims to contribute to a deeper understanding of path dependency in South Africa. It concludes that the business system is segmented between formal and informal firms and that such segmentation is correlated with race. Despite path dependency, a group of black entrepreneurs has managed to breach the barriers, owing to the ongoing support of an intermediate organisation, intense networking and risk taking.

Keywords: business systems; innovation; segmentation; informality; South Africa

5.1 INTRODUCTION

This chapter analyses the second case study on incremental innovation of craft exporters in Cape Town. An analysis based on the innovation system perspective, as conducted in the previous chapter, did not yield any significant result and hence the study explored the other two perspectives introduced in chapter 2 (business systems and institutional path dependence). By combining the three perspectives, a new exploratory model has been developed and tested (see also chapter 2). However, as the business system of Cape Town has not renewed itself over time, the perspective of path renewal is only briefly referred to and remains untested. The research question that proved to be most relevant is as follows: How does the path dependent segmentation of the business and innovation system explain differences in incremental innovation among Cape Town's craft exporters? Its main academic relevance lies in the testing of the exploratory model in a case study with a segmented business and innovation system.

The economy of South Africa comprises both formal and informal firms (Bischoff and Wood, 2013; Ligthelm, 2008), with the former being owned mainly by white entrepreneurs and the latter mainly by black entrepreneurs (Devey *et al*., 2006; Herrington *et al*., 2010). In general, black South Africans face more barriers in starting and running a formal firm than do their white counterparts. These barriers are related to factors such as access to education (Kruss *et al*., 2010),

government support (Ashman and Fine, 2013) and social networks (Adato *et al*., 2006). The core problem addressed in this chapter is that these barriers might be institutionally path dependent because of the segmentation of the business system. Path dependency entails that future development trajectories are influenced by the past and the present (Martin and Sunley, 2006). In particular, differences between black and white entrepreneurs can be traced to apartheid and colonialism (Gradín Lago, 2013; Wilson, 2011). A segmented business system means that formal and informal firms are coordinated and controlled differently by the government, have different firm characteristics, and interact differently with other firms and non-firm actors (Wood and Frynas, 2006). The literature appears silent on the segmentation of business systems in South Africa, and an analysis of this concept would contribute to a deeper understanding of path dependency and racial determination of the formal and informal sectors.

The paper aims, first, to study the path dependency of the formal and informal sectors and whether such segmentation is still determined by race. Second, it examines whether and how black entrepreneurs might be able to set up and run formal firms despite strong path dependency. The paper conducts a case study of handicraft exporters in Cape Town. This case study is particularly relevant, because these exporters range from innovative formal firms to poverty-driven informal firms. Cape Town is also arguably the global market leader in contemporary African crafts.

Based on a literature review, a model of path dependency is proposed that connects the segmentation of the business system to the segmentation of the innovation system and to innovation outcomes. The segmentation of the business system between a formal and an informal sector explains sustained differences in the practices of firms. Various elements of the business system are expected to have a direct impact on innovation practices, and together form an innovation system (Lundvall, 2007). Segmentation of such an innovation system might result in major differences in innovation outcomes between formal and informal firms, which might in turn reinforce the segmentation of the business system. It is difficult and time consuming to change such a path-dependent and segmented business system, but it is not impossible. Such a change is called path creation.

The chapter is structured as follows. Section 2 describes why and how segmented business systems result in path dependency and how new development paths might be created. Section 3 reviews research methodologies and section 4 describes the main findings of the research. Section 5 presents a discussion, conclusions and recommendations. This includes a discussion on the chapter's relevance for the thesis as a whole.

5.2 THEORY

5.2.1 BUSINESS SYSTEMS

Formal and informal firms generally operate in different segments of a business system (Pedersen and McCormick, 1999; Wood and Frynas, 2006). The concept 'business system' describes distinct forms of economic coordination and control within a territory. These distinct forms are internally coherent, and firms within one business system tend to have comparable business strategies. They also clearly differ from other business systems, resulting in differences in the firms' business strategies between these systems.

Business systems comprise three interrelated elements: government coordination and control, firm characteristics, and cooperation (Whitley, 2000). First, the government actively shapes the economy. It sets and enforces rules that govern firm ownership and control, property rights, the financial system, the education and training system, and labour market organisation (Whitley, 1992:13). These rules tend to change slowly. A 'developmental' government develops rules, regulates markets, and organises support such as education, training, property rights and labour protection. Firms therefore operate within a relatively secure and supported environment. A weak or disinterested government might fail to create adequate rules, regulation or support for the economy. Firms might be left without well-educated and trained staff, finance or support for business development. Intermediaries, such as business associations, might tailor the support that governments offer. Second, firms are key economic actors, managed by entrepreneurs. Large firms are expected to have competencies in-house, while smaller firms depend more on cooperation with other actors. Thus the third element of a business system is cooperation between firms and non-firm actors (such as central and local governments, trade unions, business associations and chambers of commerce). Cooperation is enabled by trust among actors in a business system. These three elements co-evolve, resulting in distinct business systems (Whitley, 1992, 1999 and 2000) that might range from large, state-owned firms operating in relative isolation from other firms to clustered, small firms operating below the radar of the government.

A segmentation of business systems occurs when multiple business systems exist within a single territory. Within each segment, the role of the government and intermediaries is distinct, as are the characteristics of the firms and the forms of cooperation between them. Firms in each segment adapt their practices to their particular segment of the business system, which accounts for major differences in business practices within a country (Witt and Redding, 2013). Business systems

can become segmented if the government is weak or has a narrow social base. Colonial boundaries have often led to the segmentation of business systems, within which people have distinctly different social networks (Whitley, 1992).

Segmented business systems have been studied in, among other places, East Africa (Wood and Frynas, 2006), Mozambique (Wood *et al*., 2011), China and India (Witt and Redding, 2013). It has been argued that business systems in various African countries are segmented between foreign-owned exporters, indigenous 'formal' firms and indigenous 'informal' firms (Pedersen and McCormick, 1999; Wood and Frynas, 2006). Foreign-owned exporters form part of global value chains. Where they operate in enclaves, they tend to function as a separate segment, relatively disconnected from the local economy (Melese and Helmsing, 2010). Indigenous formal firms generally abide by the rules of the country, while indigenous informal firms often operate beyond formal rules. While there might be comprehensive rules, these are not adequately enforced (Pedersen and McCormick, 1999; Wood and Frynas, 2006).

A study of formal–informal segmentation is challenging because informality is heterogeneous and ill-defined. Perry (2007) and Ligthelm (2008) identify two distinct types of informal firms, which are at the opposite ends of a continuum: firms driven by opportunity and firms driven by poverty. Opportunity-driven firms choose to operate below the radar of the government in order to circumvent regulatory burdens and taxes. This segment of the informal economy is often entrepreneurial and closely connected to formal firms. Poverty-driven firms, on the other hand, are established as a survival strategy of poor households. They are generally associated with low incomes, vulnerability, poor labour productivity, limited risk taking and low levels of innovation (Perry, 2007). Since the segmentation between formal and opportunity-driven informal firms is open to debate, this paper equates informal firms to poverty-driven firms.

Informality has been widely studied in South Africa. These studies show that the South African government tends to play an important role in the formal sector: it coordinates, involves intermediaries, provides education and training, and ensures that laws are applied. Formal firms mainly operate within the rules set by the state and benefit from a sophisticated support and financial system (Ashman and Fine, 2013; Bischoff and Wood, 2013). Education and training are generally of a high quality, although the quality of education and training for workers leaves much to be desired (Kruss *et al*., 2010). In contrast, informal firms tend to operate below the radar of the government, are informally organised (Bischoff and Wood, 2013), and obtain hardly any support from the financial system (Padayachee, 2013) or from policies aimed at small and medium enterprises (Devey *et al*., 2006; Rogerson, 2003).

There are also distinct differences in the characteristics of firms and the cooperation among them. Formal firms tend to be owned by white entrepreneurs and informal firms by black entrepreneurs (Devey *et al*., 2006; Herrington *et al*., 2010). Formal firms tend to be larger in size, operate internationally, have a formal departmental structure with transparent reporting lines, and are likely to take risks. Entrepreneurs are likely to have a higher level of education and relevant experience. Informal firms tend to be smaller and operate in the local market. Their income levels are considerably lower than those of comparable formal jobs and incomes hover around the poverty line (Ashman and Fine, 2013; Bargain and Kwenda, 2010; Ligthelm, 2008).

The various elements of informality might reinforce each other and create path dependency. For instance, when an informal entrepreneur has a lower level of education than a formal entrepreneur, employs fewer qualified staff, receives less support from government and intermediary organisations, and only networks with other informal firms, it is hard for such an entrepreneur to formalise. In this case, the segments of the business system are coherent. If the segments were less coherent, for instance when the entrepreneur is better educated, breaching the barriers would be easier. Therefore, the more coherent the segments of the business system, the higher the barriers to entering the formal segment.

There are indications that segmentation in South Africa might be decreasing and becoming less determined by race. On the one hand, the formal economy appears to 'informalise', which is defined as increasing non-compliance with legislation (Bischoff and Wood, 2013). On the other, the number of black entrepreneurs in the formal sector has slowly increased (Iheduru, 2004; Leibbrandt *et al*., 2012; Randall, 1996). Since 2010, more black entrepreneurs have set up formal firms (Herrington *et al*., 2014). This trend might indicate path creation. Before the discussion on path creation, the next section examines how differences in innovation systems and innovation are reinforced by path dependency.

5.2.2 INNOVATION SYSTEMS

This paper argues that the formal–informal segmentation of the business system involves elements that determine the level of innovation in firms. These coherent elements are referred to as 'innovation systems' (Lundvall, 2007). The formal and informal innovation systems are analysed below, based on (1) the role of the government and intermediaries, (2) firm characteristics, and (3) forms of coordination.

First, the government and intermediary organisations might create an enabling environment for innovative firms. Their core role is to build the competencies of firms and individuals through education, training and support for business development (Gaul, 2004; Lundvall, 2007; Lundvall *et al.* 2002). The government might also set rules on industrial standards and intellectual property rights. The creation and exchange of knowledge can be advanced through promoting networking among firms, research institutes and other local actors (Asheim and Isaksen, 2002; Lundvall, 2007). A supported innovation system generally enables firms to innovate faster and with lower transaction costs. Informal firms, however, might not fully benefit from such an innovation system because they are not part of the formal business system and/or cannot meet industrial standards.

Second, firm characteristics influence the ability of formal and informal firms to innovate. This includes the capacity to acquire knowledge from buyers, the government and other actors; share knowledge within the firm; transform the firm; and exploit knowledge in the market (Cohen and Levinthal, 1990; Zahra and George, 2002). Formal firms tend to benefit from having more capable and better-educated staff, who operate in specialised departments. When these firms innovate, they accumulate even more knowledge. For informal, smaller firms, it might be difficult to grasp the importance of new knowledge, as the gap between their knowledge and the available knowledge might be too large to bridge (Zahra and George, 2002). They also tend to have fewer and less-educated staff (Perry, 2007).

Third, the form of coordination among firms and non-firm actors also influences innovation. In emerging economies, many firms absorb knowledge from 'global value chains', a term that describes all activities required to bring a product or service from conception, through production, to delivery to consumers (Kaplinsky and Morris, 2001:4). Suppliers in emerging economies can acquire knowledge from global buyers, which might not be available locally. However, the ability to acquire knowledge from global buyers is likely to differ between formal and informal firms. Informal firms often do not export; even if they do, their relatively low capacity tends to force them to the bottom of these value chains. Here they are more likely to function as subcontractors (Kaplinsky and Morris, 2000) and depend on transactions with a single buyer. Such an arrangement is called a 'captive' global value chain, as firms are 'captured' by a buyer. They focus on production, while the global buyers control brands, markets and designs (Gereffi *et al*., 2005). Formal firms are more likely to export and to have more capacity. They might export directly to a global buyer and might subcontract all or part of their production to informal firms (Kaplinsky and Morris, 2000; Perry, 2007). Their capacity, formal networks and government support might enable them to sell to more buyers and build up trusted relationships. Such 'relational' global value

chains offer more opportunity for innovation than do captive value chains (Gereffi *et al*., 2005).

The innovation system therefore tends to differ between formal and informal firms. The innovation system of formal firms, with its support and networks, is likely to result in a higher level of innovation. As formal firms acquire knowledge, train staff and build networks, they build their capacity. In contrast, informal firms acquire less knowledge, training and networks, which makes it harder for them to build capacity.

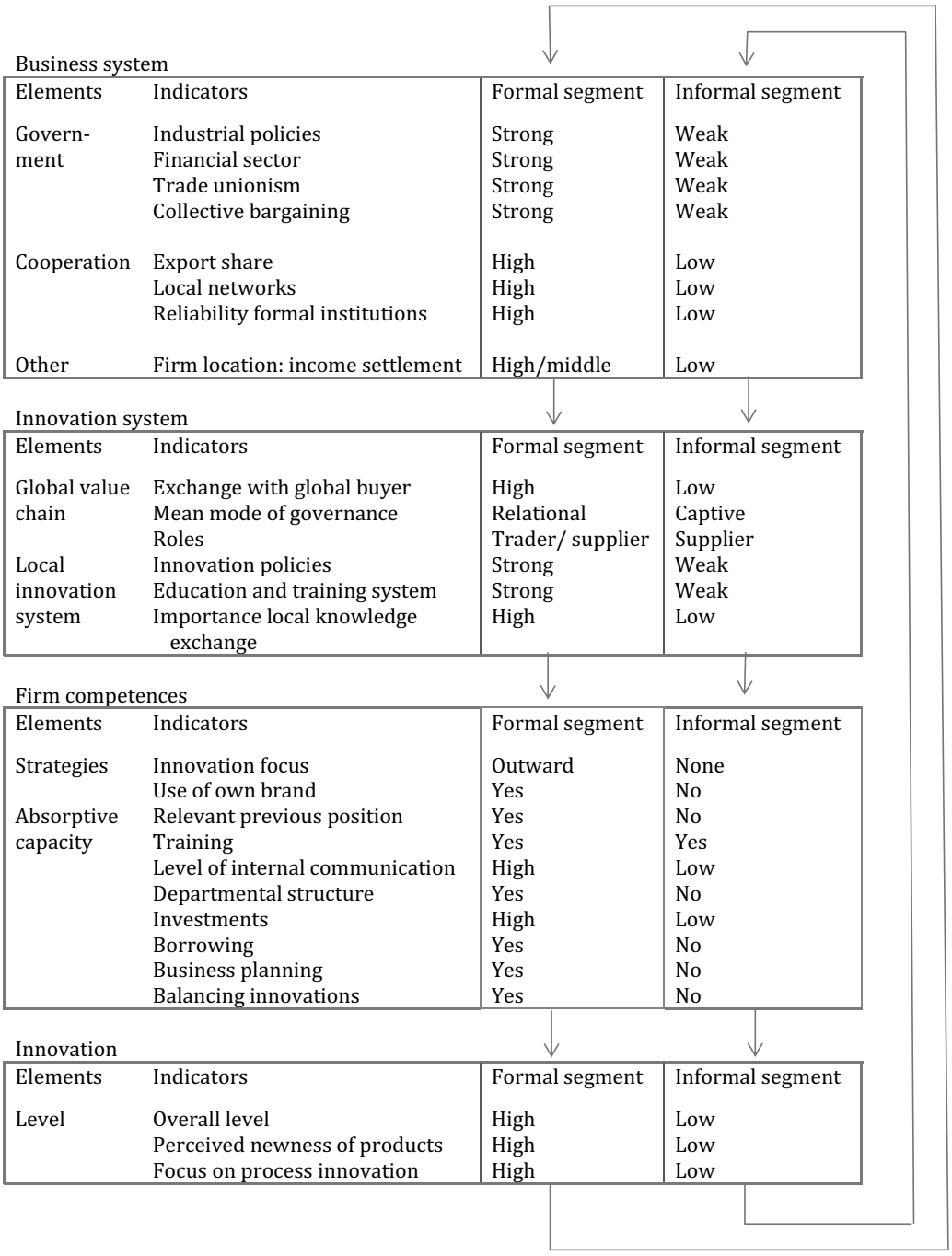
5.2.3 PATH DEPENDENT SEGMENTATION

A model of path dependence based on coherent business and innovation systems is shown in table 1. The arrows depict the feedback mechanisms that reinforce path dependency. Coherent segmentation puts formal and informal firms on different development paths (Wood and Frynas, 2006). Table 5.1 describes the segmentation in three institutional levels: the business system, innovation system and firm strategies and competences. The firm-level characteristics of the business and innovation system, as described in the two previous sections, have been moved to the lowest box of the table. The table depicts an extreme segmentation between formal and informal firms. Reality is unlikely to be as extremely segmented as depicted (Ligthelm, 2008; Perry, 2007)

The top box of table 5.1 illustrates the formal and informal segments of the business system.The formal segment is depicted as a well governed segment, supported by a functioning financial system, well integrated into the international economy and strongly coordinated by economic actors. Formal firms are expected to be located in Cape Town's middle and high income areas. In contrast, the informal segment is expected to score the opposite on all indicators of the business system (Ashman and Fine, 2013; Bischoff and Wood, 2013; Padayachee, 2013; Pedersen and McCormick, 1999; Wood and Frynas, 2006).

The middle box of table 5.1 illustrates the segments of the innovation system. Formal firms are relatively more likely to be supported by innovation policies, programmes and regulations, and to benefit from the education and training system. They are also more likely to exchange knowledge with global buyers, governments and other actors. Furthermore, relational global value chains are likely to enable firms to innovate products and processes. By contrast, informal firms are more likely to operate outside the scope of government support and to function as suppliers in captive global value chains at the bottom of the global value chain (Kaplinsky and Morris, 2000; Perry, 2007).

Table 5.1 A model of path dependent segmentation



Business system

Elements	Indicators	Formal segment	Informal segment
Govern-ment	Industrial policies	Strong	Weak
	Financial sector	Strong	Weak
	Trade unionism	Strong	Weak
	Collective bargaining	Strong	Weak
Cooperation	Export share	High	Low
	Local networks	High	Low
	Reliability formal institutions	High	Low
Other	Firm location: income settlement	High/middle	Low

Innovation system

Elements	Indicators	Formal segment	Informal segment
Global value chain	Exchange with global buyer	High	Low
	Mean mode of governance	Relational	Captive
	Roles	Trader/ supplier	Supplier
Local innovation system	Innovation policies	Strong	Weak
	Education and training system	Strong	Weak
	Importance local knowledge exchange	High	Low

Firm competences

Elements	Indicators	Formal segment	Informal segment
Strategies	Innovation focus	Outward	None
	Use of own brand	Yes	No
Absorptive capacity	Relevant previous position	Yes	No
	Training	Yes	Yes
	Level of internal communication	High	Low
	Departmental structure	Yes	No
	Investments	High	Low
	Borrowing	Yes	No
	Business planning	Yes	No
	Balancing innovations	Yes	No

Innovation

Elements	Indicators	Formal segment	Informal segment
Level	Overall level	High	Low
	Perceived newness of products	High	Low
	Focus on process innovation	High	Low

The third box of table 5.1 illustrates the firms' strategies and competences. Formal firms are more likely to be opportunity-driven, strategize innovations, promote their own brands and absorb knowledge. By contrast, informal firms are more likely to be poverty-driven and to avoid innovation risks and investments in competences (Devey et al., 2006; Herrington et al. 2010; Pedersen and McCormick, 1999; Wood and Frynas, 2006).

Segmented business systems can become path dependent and highly resistant to change if segments are coherent (Whitley, 1992). The triggers of segmentation may be found in some long ago, initial events during apartheid and colonialism, which may have had an irreversible and self-reinforcing effect on the economy and society at large. More recent events, such as the end of apartheid and opening up of the economy, may reinforce or challenge the segmentation (Martin and Sunley, 2006). In particular the business system is expected to be path dependent, while innovation systems and firms might change faster. A formal firm might, for instance, employ new staff or start to operate in another global value chain. The segmentation of the innovation system is nevertheless important because it explains differences in innovation, the lowest box of table 5.1. Differences in innovation in turn reinforce segmentation in the business system, as firms invest their scarce resources in specific products, technologies and markets. A higher level of innovation also enables a firm to keep learning and adjusting to changing markets and new technologies.

Path creation, the process of changing existing development paths or creating new ones, could conceivably explain the emergence of formal black crafters in Cape Town. The ending of apartheid may result in the ending of the segmentation and the start of a new development trajectory. Instead, it may also be that the economy remains segmented, but some informal firms are able to formalise. In such a case the segmentation is breached. Two causes of path renewal of the more regular breaching of segmentation are studied. The first is a paradigm shift within laws and/or social networks (Williamson, 1995 and 2000). South Africa is a good example of such a paradigm shift, as its laws changed significantly when apartheid was abolished. Since the end of apartheid, major policy efforts have aimed at reducing racial segmentation as well as the segmentation of business systems. During the past two decades, South Africa has been acknowledged as a leader in local economic development. Municipalities were given a developmental role to promote pro-poor growth (Nel *et al*., 2009; Rogerson, 2010), small and medium-sized firms have been supported (Herrington *et al*., 2010), and black entrepreneurship and employment were promoted through black economic empowerment initiatives (Iheduru, 2004). The impact of these policies has been widely questioned (Devey *et al*., 2006; Iheduru, 2004; Padayachee, 2013; Rogerson, 2003). In particular, it has been argued that the government's response

to the challenge of segmentation was weak and late in coming (Nel *et al*., 2009; Rogerson, 2010). Despite such criticism, however, it is not unlikely that the current indications of a softening in the formal–informal segmentation of the business system, as discussed in section 2.1, is a long-term effect of a change in laws. Relatively small but focused support programmes might facilitate a change through continuous support, as shown by Keller and Block (2013) in the United States.

The second way of path creation is through path-breaking innovations (Whitley, 1992). Innovation can steer development paths in new directions, sometimes leading to the transformation of innovation and business systems (Martin and Simmie, 2008). However, most innovations are incremental and hardly affect innovation systems, let alone business systems (Whitley, 2000).

The remainder of this article assesses path dependency based on table 5.1, and analyses whether and how a change of laws might have enabled a group of black crafters to start and run formal firms.

5.3 METHOD

The analysis uses a mixed-method approach, including a small survey of 83 exporting firms, relatively rich qualitative data and an analysis of secondary data. For the survey, a random sample of 72 formal firms was drawn from a database of 232 exporters. Of these firms, 59 are owned by white and 13 by black entrepreneurs. The database was compiled using data of the Cape Craft and Design Institute (CCDI), data of trade fairs, and an elaborate web search. As poverty-driven informal firms are not listed in these databases, 11 informal firms were selected through snowball sampling. All informal firms have black entrepreneurs. Qualitative data was collected from semi-structured interviews with 11 firms, 9 non-firm actors and 3 experts. Respondents were selected from the wider Cape Town city-region, which operates as a single economic space (OECD, 2008).

The indicators are presented in table 5.1. They differ somewhat from the indicators presented insection 3.2 on the operationalisation of the research as a whole. First, the measurement of the business system includes an additional indicator for the location of firms, in order to assess the impact of Cape Town's spatial structure on segmentation (Pieterse, 2010). Second, a few indicators are not used, since they are irrelevant for the study of segmentation or they proved to

be invalid[6]. On institutional path dependence, only the self-reinforcing coherence of the system has been assessed. This comprises the self-reinforcing impact of initial events and to a lesser extent that of recent events. Path creation is not found.

The segmentation was statistically analysed using a TwoStep cluster analysis of IBM SPSS Statistics 20. The cluster analysis was conducted using all the indicators of the business and innovation systems, and cluster quality proved strong. The internal coherence and external variance of the segments of the business system were assessed using an ANOVA variance analysis. In order to check for counterarguments, a cluster analysis was run, using a smaller number of indicators: captive versus relational global value chains; exporters versus subcontractors; different levels of capacity; and black versus white entrepreneurs. Of all potential clusters, the segmentation between formal and informal firms had the highest internal coherence, external variance and explanatory power.

In order to analyse whether the segmentation of the business systems was determined by race, a multiple regression analysis was conducted, using IBM SPSS Statistics 20. Given the binary nature of the dependent variable, segmentation was estimated using binary logistic regression analysis. Innovation outcomes, as a categorical variable, were estimated using ordered probit regression. The robustness of the models was improved by trimming three outliers. Statistical analyses were controlled for firm and entrepreneurial characteristics and subsector.

5.4 FINDINGS

The findings of the study are first presented in terms of the model of path dependent segmentation, through an analysis of the segmentation of the business system, innovation system and firm strategies and competences, as well as resulting differences in innovation outcomes. This is followed by an analysis of path creation, detailing whether and how black entrepreneurs have been able to set up and run formal firms despite path dependency.

[6] Excluded indicators are 'perceived importance of knowledge from trade fairs', 'trust in global buyers' and innovation focus', as the responses were invalid. Indicators on observation, clustering and spillover, IPR strategies, frequency of international travel and language abilities proved irrelevant in analysing segmentation.

5.4.1 SEGMENTED BUSINESS SYSTEMS

The TwoStep cluster analysis shows that the business system is segmented in accordance with the model of path dependent segmentation, as suggested by the significant differences between all indicators of the business system. However, the study results show that formal firms score 'medium' instead of 'strong' on government policies, programmes and regulations and the strength of the financial system. In addition, trade unionism and collective bargaining are very weak in handicraft exports and hence do not differ between formal and informal firms (see table 5.2).

The formal sector has a number of distinct and coherent characteristics. Formal firms tend to abide by the rules and regulations of the government, to benefit from the extensive financial sector in Cape Town, operate from high- to medium-income areas and to combine exports with local sales. About 30% of these firms are located in business districts or around craft markets, shopping malls, or The Fringe, a 'design and innovation district' in Cape Town, where they benefit from world-class infrastructure and services. Formal firms do not adhere very strictly to labour regulations, and many labourers work on a casual basis. Furthermore, only 19 percent of all crafters borrow money from banks, indicating that the financial sector is not often used. Trade unionism and collective bargaining are also relatively weakly developed. As a result, the policies, programmes and regulations and the financial sector are seen to be of a 'medium' strength and trade unionism and collective bargaining are seen as 'weak' (see table 25.). Formal firms however benefit significantly more from government policies and programmes than do informal firms. Qualitative data shows that the government has supported handicrafts since 1994, with Cape Town being one of three hubs receiving additional support. These policies blend racial integration with economic objectives (DTI, 2005; Kaiser Associates, 2009). Furthermore, formal firms coordinate significantly more with global buyers, the government and other actors than do informal firms, especially through intermediaries. Especially the Cape Craft and Design Institute (CCDI) is perceived as an important actor.

In contrast, informal firms tend to operate below the radar of the government. The entrepreneurs unanimously expressed that they are unaware of government policies, programmes and regulations and are not supported in any way. This finding was confirmed in semi-structured interviews. The informal firms also score very low on the coordination and reliability of formal institutions, which may be caused by the lack of government support and weak social networks (see table 5.2). The weak social networks correlate with the location of firms in low-income settlements. Furthermore, the data reveals that most entrepreneurs are from the

Eastern Cape and the remaining 30% of the entrepreneurs are from neighbouring countries. This implies that their social networks are likely to be relatively weak.

Table 5.2 Cluster analysis of the segmented business system

Elements	Indicators	Formal			Informal
		Black A	White B	Total C	 D
Govern-ment	Industrial policies[1]	Medium	Medium	Medium	Weak
	Financial sector[1]	Medium	Medium	Medium	Weak
	Trade unionism	Low	Low	Low	Low
	Collective bargaining	Low	Low	Low	Low
Coordina-tion	Local networks	2.3^{CD*}	1.7^{BD*}	1.^{9AD*}	1.0^{ABC*}
	Export share[2]	44^{D}	36^{D}	38^{D}	0^{ABC}
	Importance CCDI	3.3^{CD}	2.2^{D}	2.^{4AD}	1.0^{0ABC}
	Reliability formal institutions[1]	High	High	High	Low
Other	In informal settlement	0%^{D}	0%^{D}	0%^{D}	60% ^{ABC}
Observations		13	59	72	11

Notes: Variance analysis based on One Way ANOVA, α=0.05, with a Bonferroni multiple comparison test. ^{ABCD} The indicator differs significantly at α= 0.05 with the mentioned column. * Significant at α=0.10. [1] Measured qualitatively. [2] Measured as the percentage exported

5.4.2 SEGMENTED INNOVATION SYSTEM

The innovation system is similarly segmented between formal and informal firms (see table 5.3). Formal firms benefit from a strong education and training system, as expressed in semi-structured interviews and by Kruss *et al.* (2010). It is also indicated by the high levels of education and training of entrepreneurs.

The formal firms attach considerably more importance to knowledge exchange with global buyers and local actors and knowledge exchange with global buyers is more likely to take place in relational global value chains. The role of formal firms in these chains is primarily that of pioneers or adapters of contemporary African design to global markets. In this innovative market niche, Cape Town's formal firms are world leaders. The CCDI is seen as the key intermediary actor. Qualitative data shows that it offers sectoral business development services, a laboratory and networking support. It is located in The Fringe, close to many formal firms, and offers applied sectoral knowledge. Another institution, Design Indaba, organises

trade fairs, exhibitions and conferences. The Cape Peninsula University of Technology proactively supports both the CCDI and Design Indaba, educates designers and collaborates with government programmes. The Department of Trade and Industry designs and implements policies and offers subsidies for entrepreneurs to attend trade fairs.

Table 5.3 Cluster analysis of the segmented innovation system

Elements	Indicators		Formal		Informal
		Black A	White B	Total C	D
Global value chain	Perceived importance knowledge global buyer[1]	4.2[D]	3.4[D]	3.6[D]	1.4[ABC]
	Role: supplier (dummy)[2]	0.00[D]	0.02[D]	0.01[D]	0.91[ABC]
	Quasi-hier. value chain (dummy)[2]	0.00[D]	0.02[D]	0.02[D]	0.91[ABC]
Local innovation system	Innovation policies	Strong	Medium	Medium	Weak
	Importance local networks[1]	4.2[BCD]	3.4[AD]	3.5[AD]	2.2[AB]
	Exchange non-firm actors[1]	2.3[BD*]	1.7[AD*]	1.9[D]	1.0[ABC*]
	Exchange with CCDI[1]	3.3[BD]	2.2[AD]	2.4[D]	1.0[ABC]
	Education/ training system	Medium	Strong	Strong	Weak
	Higher educated dummy[2]	0.69[CD]	0.93[AD]	0.89[AD]	0.36[ABC]
	Primary education dummy[2]	0.23[BD*]	0.03[AD*]	0.07[D]	0.55[ABC*]
	Education: art/ design[2]	0.67	0.64	0.65[D]	0.00[C]
Observations		13	59	72	11

Notes: Variance analysis based on One Way ANOVA, α=0.05, with a Bonferroni multiple comparison test. [ABCD] The indicator differs significantly at α= 0.05 with the mentioned column. * Significant at α=0.10. [1] Measured on a Likert scale from 1–5. [2] Measured on a scale from 0 to 1.

The informal sector is significantly different (see table 5.3). Its entrepreneurs hardly benefit from the education and training system, as indicated by significantly lower levels of education. Kruss (2010) associates this with their location in informal settlements. Informal firms do not perceive knowledge from the government or intermediaries as important and indicate not to exchange knowledge with them. Furthermore, all the informal firms in the sample are subcontractors and operate mainly in captive global value chains. They are highly dependent on knowledge, materials and tools from the firms that subcontracted the production to them. As respondent #16, who subcontracts work to poverty-driven firms, explains:

> They [informal firms] are not exposed to magazines. They make designs out of their head based on what they see, such as billboards. We inspire them by giving them designs from magazines.

Poverty-driven firms mainly imitate the product designs of the contracting firm or adapt these slightly, if required. As subcontractors of respondent #16 explain:

> We always make what [respondent #16] tells us to make. She gives us pictures and explains what we have to make. Also the colours and the designs. She gives us the beads and other material that we need (respondents #35–37).

5.4.3 Firm competences and characteristics

The cluster analysis shows that formal and informal firms differ significantly in their strategies, competences and characteristics (see table 5.4). Formal firms are significantly more likely to strategise product innovation and protect their designs. The absorptive capacity of formal firms is also significantly higher than that of informal firms and correlates with the higher level of education of entrepreneurs. Entrepreneurs of formal firms are more likely to have relevant work experience, conduct more discussions with staff, attend more training, undertake more business planning, and invest more in research and development. About 82% of formal firms are run by white entrepreneurs, and most are risk-takers. Larger firms tend to have a departmental structure (see table 5.4). Many subcontract production to informal firms, which allows them to be more flexible, produce at a lower cost, and/or brand themselves as social entrepreneurs.

Informal firms can potentially learn from the contracting firms how to produce according to international standards, but they are constrained by their limited absorptive capacity and a lack of support from the government and intermediaries. They do not strategise innovation, as this is seen to be risky. These entrepreneurs are significantly less inclined to take the risks associated with innovation. All informal firms in the sample are run by black entrepreneurs and none have a departmental structure. The entrepreneurs are poverty-driven.

Table 5.4. Cluster analysis at the level of the firm

Elements	Indicators	Formal			Informal
		Black A	White B	Total C	 D
Firm strategies	Brand name (dummy)[1]	0.93[D]	0.98[D]	0.97[D]	0.09[ABC]
	IPR protection (dummy)[1]	1.00[D]	0.71[D]	0.76[D]	0.09[ABC]
Absorptive capacity	Previous experience[1]	0.24	0.51[D]	0.45[D]	0.09[BC]
	Departments dummy[1]	0.08[B]	0.56[AD]	0.46[D]	0.09[BC]
	Staff training[1]	0.46[D]	0.43[D]	0.37[D]	0.00[ABC]
	Training entrepreneur[1]	0.92[BCD]	0.58[AD]	0.62[AD]	0.09[ABC]
	Internal communication[1]	0.31[B]	0.66[AD]	0.59[D]	0.09[BC]
	Business plans (% firms)[1]	0.54[D]	0.50[D]	0.51[D]	0.00[ABC]
	Borrowing (dummy)[1]	0.08	0.24	0.20	0.09
	R&D investments (% firms)[1]	0.69	0.93[D]	0.87[D]	0.45[BC]
	Balancing innovations[1]	0.31[D]	0.29[D]	0.30[D]	0.09[ABC]
Control variables	Size: employment (mean)	12	0.15	14	3
	Risk-taking propensity[2]	4.5[D]	3.8[D]	3.9[D]	2.5[ABC]
	Race entrepreneur: % black	1.00[BC]	0.00[AD]	0.18[D]	1.00[BC]

Notes: Variance analysis based on One Way ANOVA, α=0.05, with a Bonferroni multiple comparison test. [ABCD] The indicator differs significantly at α= 0.05 with the mentioned column. [1] On a scale from 0 to 1. [2] On a scale from 1 to 5.

Formal and informal firms do not differ significantly in size. The reason is that the size of formal firms varies from single-person firms (an artist working alone) to a firm of 170 staff (selling standardised metal sculptures). The size of informal firms ranges from a single-person firm (e.g. a woman producing beaded dolls from home) to a firm with 11 staff (producing designer mirrors, which are ordered by a formal firm in Cape Town).

5.4.4 INNOVATION OUTCOMES

As expected, the different segments of the innovation system have different innovation outcomes (see table 5.5). Formal firms perceive themselves as significantly more innovative. Their artistic, contemporary designs enable them to sell at high prices. Formal firms also open up new market opportunities, for instance by exhibiting at the launch of an upmarket vehicle (respondent #9). In contrast, informal firms tend to imitate the designs of the contracting firm, sell only to this firm, and charge low prices. The differences in process innovation is

small. It appears that neither formal nor informal firms are likely to innovate their processes.

Table 5.5 Cluster analysis of innovation outcomes

Elements	Indicators	Formal			Informal
		Black A	White B	Total C	D
Level[1]	Perceived innovation level	4.1[D]	4.2[D]	4.2[D]	3.3[ABC]
	Process innovation[1]	2.2	1.9	1.9	1.6
	Product innovation[2]	3.0[D]	3.2[D]	3.2[D]	2.2[ABC]
	Market innovation[1]	2,6	3.6[D]	3.5[D]	1.6[BC]
Observations		13	59	72	11

Notes: Variance analysis based on One Way ANOVA, α=0.05, with a Bonferroni multiple comparison test. [ABCD] The indicator differs significantly at α= 0.05 with the mentioned column. [1] Measured on a Likert scale from 1–5. [2] Measured on a scale from 1-4.

A regression analysis reveals that differences in innovation outcomes are explained by the segmentation of the innovation system (see table 5.6). In general, formal firms, especially those focusing on arts and design, are more innovative. Better-educated entrepreneurs are also more likely to be innovative than less-educated ones. Innovation reinforces segmentation, because it enables firms to learn and improve performance. Formal firms acquire significantly more knowledge, attend more training courses, and develop more networks. As a result, they learn faster.

Table 5.6 Predictors of the innovation level

	Min	Max	Mean	Standard deviation	Regression on innovation level
Innovation level	1	5	3.0	0.841	
Informal firms	0	1	0.13	0.341	-1.164** (0.515)
Artistic products	0	1	0.17	0.377	1.248*** (0.394)
Education level: primary	0	1	0.13	0.341	-0.847* (0.483)
Observations					83
Adjusted R^2 (Nagelkerke)					0.321

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

A robustness analysis is used to show which elements of the innovation system best predict the level of innovation. On the whole, firms that operate in relational global value chains, export their products and exchange knowledge with local buyers are more likely to be innovative. In this sample, all of these firms are formal. In contrast, firms that operate in captive global value chains, function as subcontractors and exchange little knowledge with local buyers are less innovative. All of these firms are informal in this sample. This shows that the characteristics of the value chain within which firms operate predict both innovation and segmentation of the business system. Therefore, value chains reinforce the segmentation of business and innovation systems.

5.4.5 BREACHING THE BARRIERS

The study finds anecdotal evidence of the long-term and self-reinforcing effects of initial events, strengthened by the coherence of the segments. In South Africa, the correlation between race and the segmentation of the business system can be traced to colonialism and apartheid. During that period, the social base of the government was narrow, as it mainly served the white population (Gradín Lago, 2013:187; Wilson, 2011). Black South Africans faced virtually impenetrable barriers in setting up and running formal firms; these barriers were created through laws, local by-laws and segmented social networks (Cornelissen and Horstmeier, 2002; Iheduru, 2004; Wilson, 2011). Towards the end of apartheid, the Business Act (No. 71 of 1991) effectively banned informal traders from inner city and shopping areas (Wesgro, 2000). These roots of segmentation – as initial path events –are still in evidence today. Segmentation is mirrored in the spatial structure of cities (Pieterse, 2010), racially structured social networks (Adato *et al*., 2006), skewed access to education, persistent differences in the quality of education (Kruss *et al*., 2010), and a dysfunctional labour market (Gradín Lago, 2013). As people identify with their specific local environment, spatial segmentation continuously reinforces racial segmentation (Cornelissen and Horstmeier, 2002).

However, recent events challenge path-dependent segmentation. Two key events are the mentioned policy changes following the end of apartheid and the opening up of the economy, resulting in the operation of firms in global value chains. A regression analysis reveals that the likelihood of a firm being informal is no longer determined by the race of the entrepreneur, given that a group of black entrepreneurs now run formal firms, as discussed below. Instead, the key determinant is whether the firm operates as a subcontractor (see table 5.7). Therefore, the study finds that segmentation is reinforced by the role of firms in global value chains and no longer by race. At the same time, segmentation and

being a subcontractor still correlate significantly with race. That raises the question how black firms have been able to join the formal sector.

Thirteen black entrepreneurs have joined the formal sector. By and large, their firms are similar to those of their white counterparts. The entrepreneurs operate in similar legal environments and social networks (see table 5.2), the firms have similar knowledge networks (see table 5.3) and capacity (see table 5.4), and they innovate in similar levels (see table 5.5). The crucial differences between black- and white-owned firms are in the specific role played by the government, in other characteristics of the firms, and in the forms of coordination between firms.

Table 5.7 Predictor of segmentation

	Min	Max	Mean	Standard deviation	Regression on segmentation
Subcontractor	0	1	0.14	0.345	6,538*** (1.454)
Observations					81
Adjusted R^2 (Nagelkerke)					0.805

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

First, black entrepreneurs are significantly closer to the government and intermediary actors than are white entrepreneurs. They have received considerable training, advice and financial support over a long period (see table 5.2). A majority (54%) have prepared business plans with the support of the CCDI (see table 5.4). The CCDI proactively visits firms, coaches entrepreneurs, sources new buyers, markets products, and invites firms to networking events and trade fairs. In contrast, white entrepreneurs perceive the CCDI as 'far behind' (respondents #17 and 74) and its training as 'irrelevant' (respondent #16).

Second, black entrepreneurs have, on average, a lower level of education and experience. They communicate less with their staff and their firms are less likely to have a departmental structure. They compensate for these weaknesses in part by their high propensity for taking risks (see table 5.2 and 5.4). Qualitative data shows that business development support from the CCDI also enables them to overcome the firm-level weaknesses. Black entrepreneurs appear to take different routes to formality, depending on their level of education. Those with only a primary education generally start producing and selling products on the street (respondents #3, 26 and 76). They need extensive and sustained support by the CCDI to establish formal firms. These firms mainly operate from home, but some entrepreneurs open shops in upmarket areas in order to attract tourists and create trust among global buyers. In contrast, entrepreneurs with university degrees

generally create formal firms from the start and require less support from the CCDI, albeit still more than do white entrepreneurs (respondents #8, 11, 32 and 54).

Third, black entrepreneurs coordinate significantly more with other firms and non-firm actors, such as global buyers (see table 5.3). In contrast, white entrepreneurs primarily network with local formal firms. Respondent #58, located in one of the business districts, describes knowledge exchange among formal firms:

> We share the floor of this building … with three firms. … We especially collaborate in marketing. Interior designers approach us as a team. We always help each other. We talk about new ideas. We bounce ideas. We use the same suppliers, inform each other.

Knowledge flows quickly within these social networks. The CCDI and other local actors organise regular events, such as a design platform, meetings and a design week, to help firms share knowledge. Knowledge exchange is also facilitated by the geographical clustering of firms in and around The Fringe and shopping malls.

In summary, the main factors that enable black entrepreneurs to breach the barriers to the formal sector include extensive support (especially from the CCDI), intensive knowledge exchange, a high propensity for taking risk, frequent participation in trade events, and the clustering of firms.

5.5 Discussion and conclusions

This chapter discusses the segmentation of business systems in South Africa. Its findings are limited to an illustrative case study of handicraft exports in Cape Town. Initially, the study aimed to apply the perspective of innovation systems, but the analysis did not yield any results. Therefore, the study borrowed Wood and Frynas' (2006) concept of segmented business systems and developed a model of path dependent segmentation (see table 5.1). This revised model comes close to the exploratory model discussed in chapter 2, but it still excludes the concept of path creation. Furthermore, the analysis of path dependence is limited to secondary data and its findings are anecdotal.

Whitley (1992) argues that the segmentation of the business system is persistent if the segments are cohesive and distinct. In contrast, the segmentation of the innovation system can change more quickly (Rafiqui, 2009). While many studies assess innovation from the perspective of innovation systems, an analysis based on

business systems, as recommended by Whitley (2000), enables a longer term perspective. This analytical approach appears to be new to South Africa.

The findings show that the business and innovation systems are significantly segmented between formal and informal firms. However, segmentation is no longer determined by race. Instead, in this case study, segmentation is explained by the position of a firm in the global value chain, with informal firms largely operating as subcontractors. Global value chains also explain differences in innovation outcomes among firms. It can therefore be concluded that global value chains play an important role in reinforcing the segmentation of business and innovation systems among handicraft exporters in Cape Town. However, the segmentation is still closely correlated with race. The segments are very coherent: most informal firms are subcontractors owned by black and less-educated entrepreneurs, while most formal firms are exporters owned by white and educated entrepreneurs. Black entrepreneurs still face barriers in setting up and running formal firms, related to the application of laws, education level, previous experience, risk taking propensity, structure of the firm, location of the firm and social networks.

Segmentation can be traced to initial events during colonialism and apartheid. The laws and social networks change slowly and are still mirrored in the spatial structure of Cape Town (Pieterse, 2010), racially structured social networks (Adato *et al*., 2006), skewed access to education, persistent differences in the quality of education (Kruss *et al*., 2010), and a dysfunctional labour market (Gradín Lago, 2013). Segmentation is reinforced by differences in innovation outcomes: formal firms innovate and strengthen their competencies, while informal firms seldom do so. It can therefore be concluded that racial differences between formal and informal firms stem from differences in laws and social practices and are reinforced by global value chains and innovation outcomes.

Despite indications for path-dependent segmentation, a small group of black entrepreneurs has been able to set up and run formal firms. As Whitley (1992) and Williamson (1995) argue, a paradigm shift in laws and social practices can trigger path creation. In this case study, however, no new development paths are created, but the segmentation is breached instead. The abolition of apartheid and the formation of new regulations are good examples of paradigm shifts. Intermediary organisations and events have been instrumental in translating these new rules into concrete sectoral support programmes. The CCDI in particular offers extensive support in setting up and running formal firms and in acquiring relevant and up-to-date local and global knowledge. This support is continuous, because black formal firms still face barriers created by relatively low education levels, limited experience, a relatively weak departmental structure, and poor communication

within firms. Other factors allowing black entrepreneurs to breach the barriers include the clustering of firms, intense networking, and a strong propensity for taking risk.

Two recommendations flow from the above. First, further research is needed on the segmentation of business and innovation systems in South Africa. It is especially important to understand the role of support organisations, such as the CCDI, in enabling black entrepreneurs to enter the formal sector. It is also not clear whether the finding that formal–informal segmentation is no longer determined by race would be valid in other industrial sectors. Handicrafts have relatively low barriers of formality, which might be relatively easy to breach. Formal black entrepreneurs have also obtained government support. It is hoped that this case study could illustrate the relevance and methodology of such analyses.

Second, policy support for black, risk-taking entrepreneurs should be continued and preferably increased for craft exporters in Cape Town. Sector-specific, intermediate organisations such as the CCDI might be best placed to offer tailored support for business development. These services should include support for setting up and running businesses, and facilitate knowledge transfer, for example through trade events, meetings and training courses. These events might best be organised around clusters of firms.

6 INSTITUTIONAL REGIMES AND INNOVATION IN CHINA'S COMMODITY CITY

PUBLICATION DETAILS

Submitted single authored to Socio Economic Review.

The article has been adjusted, in order to better align it to the structure of the thesis and in particular its operationalisation of the multiple institutional levels (business systems, innovation systems, and firm strategies and competences). The abstract and the first two paragraphs of section 6.1 (introduction) and section 6.4.1 (institutional regime) have been restructured accordingly. Section 6.2 includes a new subsection on multilevel institutional regimes and a more comprehensive conceptualisation of institutional path dependence. Section 6.3 (method) adds paragraphs relating the indicators used in this chapter to those presented in section 3.2 and table 6.1 (truth table) has been restructured in line with chapters 2 and 3. A new section 6.4.4.1 has been added on institutional path dependence and table 6.8 has been adjusted in line with the operationalisation of section 3.2. Section 6.5 (discussions) and 6.6 (conclusions) have been slightly amended.

ABSTRACT

This study aims to explain skewed process innovation of craft exporters in China's Commodity City, one of the world's largest production and trading hubs in low-tech products. It argues that the institutional regime within which the craft exporters operate is multilevel, multi-spatial and dynamic. To begin with, the study describes the present multi-spatial and multilevel business system. A fuzzy-set analysis finds a strong resemblance between the case study's business system and that of a dependent economy. The defining feature is that innovation is strongly influenced by strategies of global buyers, while economic coordination by national and local actors is relatively weak. An evolutionary analysis subsequently shows that the

institutional regime is path dependent but dynamic and has renewed itself twice. Each time the level of innovation changes. Despite the unpredictability of path renewal, however, the study results show that initial institutions have an irreversible, self-reinforcing effect on firm strategies.

Key words: business systems, global value chains, innovation, path dependence, Asia, China

6.1 INTRODUCTION

The previous two chapters have shown that innovation systems may relate to the firms' absorptive capacities and that segmented business systems may explain innovation differences. However, the perspectives adopted in the previous chapters are unable to explain differences in incremental innovation in China's Commodity City. Instead, the high level of process innovation found in the case study cannot be fully appreciated from an innovation system perspective (Damanpour and Gopalakrishan, 2001; Ornaghi, 2006). Furthermore, its business system is not segmented, but instead it is rather homogeneous. The chapter therefore raises the following question: How does the institutional regime, comprising its business system, innovation system and firm competences and strategies, explain skewed process innovation in China's Commodity City?

The chapter takes a positive but critical stance towards the business system perspective, defined as the way that actors coordinate the economy, embedded in a coherent and self-reinforcing set of policies, regulations, standards, programmes, norms and values (Hall and Soskice, 2001; Whitley, 1992). Generally speaking, scholars argue that national institutions and actors affect the way that firms innovate (see for instance Allen and Aldred, 2009; Amable, 2000; Crouch, 2005; Griffith and Zammuto, 2005; Haake, 2002; Hall and Soskice, 2001; Schneider and Paunescu, 2012; Whitley, 2000). This has contributed to our understanding of innovation, but can be positively criticized on three grounds. Firstly, the national perspective is challenged by processes of globalisation, which increase the roles of international institutions and actors in economic coordination, and by processes of decentralisation, which increase the roles of local institutions and actors (Crouch *et al.*, 2009; Humphrey and Schmitz, 2002; Lane, 2008). A slowly growing body of literature has sought to establish how these multi-spatial levels co-relate (Crouch, 2005; Crouch *et al.*, 2009; Ernst, 2007; Lane, 2008; Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009). A second criticism is that institutional regimes comprise a multitude of institutions, including those discussed by the

innovation system perspective. Nevertheness, the two perspectives have drifted apart (Fagerberg, 2005). The chapter addresses this criticism by treating the business and innovation systems as separate but connected nests within an institutional regime (Amable, 2000; Helmsing, 2013; Rafiqui, 2009; Williamson, 2000). A third critical note is that institutional regimes change over time, while most scholars take a snapshot of time. This criticism is addressed by treating institutional regimes as institutionally path dependent, which entails that they evolve as a consequence of their own history (Martin and Sunley, 2006; Mackinnon, 2008).

This study analyses how Yiwu's multilevel, multi-spatial and dynamic institutional regime explains skewed process innovation of craft exporters in China's Commodity City. Process innovations are technological and organisational changes that aim for sales maximisation, cost reductions, shorter lead times and/or quality improvements of products or services (Utterback and Abernathy, 1975). It is important to better understand skewed process innovation, because it may explain low-cost mass exports as witnessed in China and other emerging economies (Ernst, 2007; Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009).

China's Commodity City offers a unique opportunity to study the effect of dynamic, multilevel and multi-spatial institutional regimes on skewed process innovation, due to the sheer size of the industry, the low level of product innovation, and the remarkable change that has occurred over time. China's Commodity City, also called Yiwu, is a city of approximately 1 million inhabitants about 200 km south-west of Shanghai. It houses the largest consumer commodity market of the world with 40,000 daily visitors and it is home to about 70,000 Chinese suppliers and 13,000 offices of global buyers (Goodman, 2011). The city is renowned for its rapid economic development based on rude, low scale, low-technology trade and industrialisation (Forste, 2000). It has carved out a market niche of simple, cheap and convenient products. These include handicrafts, defined as 'relatively small articles, which serve as supplements to the large interior furnishing products' (CBI, 2009: 44). Examples are picture frames, statuettes, baskets and trays. In some subsectors, such as Christmas products, firms hold a global market share of over 50% (Yiwu, 2014). In China's Commodity City, process innovation and imitation enable low-cost exports. By contrast, craft firms in other emerging economies such as Indonesia, the Philippines and South Africa design new products in order to benefit from a price premium on product innovations. Skewed process innovation is increasingly perceived to be problematic by scholars and Chinese policy makers. The main reason is that production costs in China are surging and competition for low-cost production increases (Ernst, 2007; Fabre, 2012). Environmental costs are also increasingly being perceived as problematic (Gu *et al*., 2009). China has

therefore established ambitious policies stimulating product innovation (Choi *et al*., 2011; Fabre, 2012; Fu *et al*., 2011; Fu and Gong, 2011; Tang and Hussler, 2011).

This paper is structured as follows. Section two briefly reviews theories on multilevel, multi-spatial and dynamic business systems. Considering the broad scope of the literature under review, this section does not aim to offer a comprehensive literature review. Section three subsequently describes the research methodology. Section four presents the main results, feeding a discussion on the theoretical contributions of the research findings. Section six answers the main research question and offers recommendations.

6.2 THEORY

This section first discusses multi-spatial and multilevel institutional regimes. It subsequently zooms in on an institutional regime relevant for the case study: a dependent economy, whereby international actors and institutions strongly condition and steer local economies. Finally, the chapter discusses the path dependence of the institutional regime.

6.2.1 MULTI-SPATIAL INSTITUTIONAL REGIMES

Generally speaking, scholars on business systems and varieties of capitalism describe how the national institutional regimes impact on the nation's economy. These institutions are bound together (Crouch, 2005) and thereby create coherence (Amable, 2000) and increased returns (Hall and Soskice, 2001). In their seminal work, Hall and Soskice (2001) describe two opposing institutional regimes: a coordinated market-economy, which is jointly coordinated by the government, intermediary organisations and firms; and a liberal market-economy, which is to a greater degree left to coordination by markets. Arguably, however, there are many other national business systems (see for instance Allen and Aldred, 2009; Carney *et al*., 2009; Crouch, 2005; Griffith and Zammuto, 2005; Haake, 2002; Schneider, 2009; Schneider and Paunescu, 2012; Whitley, 1992; Witt and Redding, 2013; Wood and Frynas, 2006; Wood *et al*., 2011).

However, none of the national business systems can fully explain specific local innovation outcomes. There is simply too much variety within countries to generalise (Allen and Aldred, 2009; Crouch *et al.*, 2009), and there is also too much influence from multinationals, global buyers and international standards to ignore (Coe *et al*., 2004; Fu *et al*., 2011; Henderson *et al*., 2002; Humphrey and Schmitz,

2002; Lane, 2008; Nadvi and Waltring, 2004; Saliola and Zanfei, 2009; Schneider, 2009).

First I will briefly discuss variation within countries. Each national economy has firms, districts, or sectors that thrive or fail in a way that appears to be incompatible with the overall pattern (Crouch *et al.*, 2009). As a result of decentralisation and globalisation, such territorial and sectoral variety has become the norm over the past decades. Scholars therefore increasingly study the effects of specific local institutions and actors on institutional comparative advantages (see for instance Crouch, 2009; Scott and Storper, 2007; Wang, 2013). In some territories, firms cluster and create exceptionally strong ties of association. These clusters may be supported by the government and by intermediary organisations, such as business associations, R&D institutes, financial institutes, training centres and business incubators (Altenburg *et al*., 2008; Asheim and Isaksen, 2002; Humphrey and Schmitz, 2002; Whitley, 1992). Furthermore, local governments are likely to adopt laws, regulations and programmes to suit their territorial specificities. A city for instance is likely to have rules and actors that differ from those in a rural territory and a harbour has rules and actors that differ from those in inland territory. As a result, national business systems comprise a variety of territorial and sectoral business systems, which may resemble or may be at odds with the national system (Crouch *et al.*, 2009).

I will now briefly discuss international institutional regimes. International standards related to health and safety, environment, product quality, conditions of employment, delivery time and payment schedules have a major impact on the innovation of firms. They can be generic, such as ISO 9000, or specific to a sector and/or region, and they can be established, monitored and implemented by a wide variety of actors (Nadvi and Waltring, 2004). Standards may create entry barriers for exports and may stimulate innovation for exporting firms. It is close to impossible for SMEs to remain abreast of international standards on their own and to simultaneously find clients in far-away countries. SMEs therefore tend to operate within global value chains, defined as the full range of activities required to bring a product or service from conception to final customers and disposal after use (Kaplinsky and Morris, 2000). Schneider (2009) argues that the dependence on orders and knowledge from global value chains may strongly affect the local economy. This will be discussed under the heading 'dependent economies'.

The meeting of international, national and local institutional regimes conditions firm strategies and competences. Exporting firms network across spatial scales and are likely to be aware of the - at times - conflicting opportunities and constraints offered by international, national and local institutions and actors. They will therefore, on the whole, adjust their way of working (Carney *et al*., 2009)

and competences (Allen and Aldred, 2009) to these various opportunities and constraints. A selection process takes place, whereby firms that have adjusted are more likely to survive (Carney *et al*., 2009). Similarities across firms' strategies and competences are subsequently expected to result in comparable innovation outcomes.

6.2.2 NESTED INSTITUTIONAL REGIMES

Institutional regimes do not only comprise multiple spatial levels, but also multiple institutional levels, whereby higher order institutions set the playing field for lower order institutions (Amable, 2000; Helmsing, 2013; Rafiqui, 2009; Williamson, 2000). In order to link the business and innovation system perspective, I propose to differentiate the business system, as a higher order institutional nest, from that of the innovation system and firm strategies and competences.

The business system comprises the norms, values, policies and regulations which condition local economic behaviour. Norms and values tend to change very slowly and affect the levels of trust and reciprocity among economic actors over sustained periods of time (Rafiqui, 2009; Williamson, 2000). Policies and regulations may relate to industrial development (which directly affects firms), the financial sector (which enables access to financial resources) and labour relations (which affect the way that entrepreneurs and staff cooperate; Hall and Soskice, 2001; Nölke and Vliegenthart, 2009).

The business system sets the framework for the innovation system. The innovation system describes systemic knowledge interaction among international, national and local economic actors ((Tödftling *et al.*, 2009), as well as the education and training system and innovation policies, programmes and regulations that directly affect knowledge exchange, diffusion and creation. Global value chains are an important source of knowledge. However, while knowledge from global value chains can enable sustained and systemic innovation, the knowledge transfer process is far from automatic (Lall, 2003), as it depends on the modes of governance in global value chains. Gereffi et al. (2005) describe five modes of governance, ranging from (quasi-) hierarchical, to arm's-length, relational and modular. The modes of governance represent different levels of dependency on the parent company. In hierarchical global value chains, the supplier is owned by the parent company, in quasi-hierarchical global value chains, the supplier transactionally depends on one global buyer, in relational and modular global value chains the supplier has a more symmetrical relationship with global buyers, and in arm's-length global value chains the relationship is impersonal. Dependency

affects innovation, because it allows the parent company to retain strategic activities such as branding, design and marketing and may therefore hinder specific innovations of suppliers (Altenburg et al., 2008; Gereffi et al., 2005).

The business and innovation system condition the firms' strategies and competences. Firm strategies can be inward-looking, aiming to improve production processes and streamline the organisation, and/or outward-looking, aiming to increase the number of customers (Damanpour and Gopalakrishan, 2001; Ornaghi, 2006). Firms can also strategically aim to use their own brands or the clients' brands and they may choose different strategies to protect their innovations. Finally, the firms can have different capacitities to absorb knowledge from other knowledge actors (Zahra and George, 2002).

6.2.3 DEPENDENT ECONOMIES

Multilevel and multi-spatial business systems may take many different forms (see chapter 2). This study zooms in on a *dependent economy*, within which the strategies of global buyers and multinationals strongly condition the way in which firms innovate, while the government and local intermediary organisations take a back seat (Nölke and Vliegenthart, 2009). That is not to say that the government and intermediaries play no role at all. They are likely to proactively support mass production for low-cost exports through industrial policies, education and training, but they are unlikely to support knowledge exchange and innovation. Trade unionism, collective bargaining and coordination of employers and staff are also likely to be relatively weak, in part because exports may depend on low-cost labour (Crough, 2005; Ernst, 2007; Wang and Lin, 2013). Dependent economies are commonly found in export-oriented emerging economies with comparative advantages in the assembly and production of consumer goods, and have been studied in China (Ernst, 2007; Fabre, 2012; Fu *et al*, 2011), Eastern Europe (Allen and Aldred, 2009; Nölke and Vliegenthart, 2009) and Latin America (Sánchez-Ancochea, 2009; Schneider, 2009).

Dependent economies come in different colours and shapes. In some Latin American countries, multinationals strongly align with national and local government and conglomerates (Schneider, 2009). By contrast, research in Eastern European countries and in China highlight the dependence on corporate decisions made by multinationals in their country of origin (Allen and Aldred, 2009; Ernst, 2007; Nölke and Vliegenthart, 2009). I limit the subsequent description of the innovation mechanisms to this second type of a dependent economy.

When local suppliers transactionally depend on orders from global buyers and multinationals, the business system depends on coordination of international actors and the innovation system on assymetrical global value chain relationships. The reason is that global buyers tend to be larger and more competent and they often retain brands, designs, research and markets. By contrast, local suppliers focus on production at a low cost (Altenburg *et al*., 2008; Gereffi *et al*., 2005; Humphrey and Schmitz, 2002). Global buyers may actively support innovation of suppliers in non-strategic areas, especially production processes, but are likely to block innovations in strategic activities such as design, branding and marketing, conditioning firms to innovate processes instead of products (Gereffi *et al*., 2005; Saliola and Zanfei, 2009). Such a relationship of dependency is most likely when suppliers are owned by global buyers, as in hierarchical global value chains, or when suppliers depend transactionally on a global buyer, as in quasi-hierarchical global value chains (Gereffi *et al*., 2005).

Suppliers are likely to adapt their innovation strategies and competences to their role in global value chains, especially if support of local non-firm actors is weak. Generally speaking, their role is to manufacture up to standard and at a low-cost, and this demands continuous cost reductions and quality improvements (Gereffi *et al*., 2005). Their strategic orientation is inward-looking, focused on production departments, and efficiency-driven (Damanpour and Gopal-Akrishan, 2001), as opposed to the market orientation of product innovators (Utterback and Abernathy, 1975). Strategic and dynamic capabilities, which enable firms to reposition themselves within markets, are of less importance, as are marketing departments and cooperation across departments (Dutrénit, 2004 and 2007; Teece, 2007). The firms are likely to export in the clients' name and to protect their production technologies.

Other institutional regimes are likely to condition innovation outcomes in different ways. A market economy, for instance, is coordinated by the numerous and anonymous interactions between buyers and sellers, instead of firm hierarchies as discussed above (Crouch, 2005; Crouch *et al.,* 2009). Such an economy offers limited opportunity for reciprocal knowledge exchange outside the market environment. Firms experience a strong price signal to innovate, but cannot incrementally innovate based on shared knowledge. Instead, firms may either innovate out-of-the-box, using their own R&D, or they may opt to imitate instead of innovate (Edquist *et al*., 2001).

The business system conditions, but does not determine innovation outcomes for two reasons. Firstly, there is room for agency, since firms do not blindly follow rules and the incentive systems of institutions and actors may be heterogeneous (Boschma and Frenken, 2011; Geels and Schot, 2007; Rafiqui, 2009). Secondly, the

business system may include niches, which are 'protected spaces' shielding firms from the mainstream business system (Geels, 2004: 912). Incubators, for instance, aim to offer new firms such a protected environment. While niches are normally studied in order to appreciate radical innovation in high-tech sectors, I apply the concept, defined as above, to low-tech sectors.

6.2.4 PATH DEPENDENCE

Institutional regimes are expected to be path dependent, which denotes that their outcomes evolve as a consequence of their own history (Martin and Sunley, 2006; MacKinnon, 2008). Path dependent systems change slowly, incrementally and predictably, continuously adapting to shocks such as relative price changes, new standards and new technologies (Hall and Thelen, 2009). International empirical comparison underlines this relative stability of innovation profiles of national economies (Strambach and Storz, 2008).

This study considers path dependence due to institutional hysteresis, that is: institutions are perceived to be relatively inflexible, irreversible and reinforce themselves over time. The irreversibility of initial institutions, which were formed long ago, is expected to have a strong and lasting impact on institutional regimes. Institutional regimes also have ergodicity, whereby institutions influence each other in non-linear ways. In mature industries, such as handicrafts, it is expected that sunk costs and vested interests add to the institutional hysteresis (Boschma and Frenken, 2006; Geels, 2004; Martin, 2012; Martin and Sunley, 2006).

The question that arises is if, how and why institutional regimes evolve in path dependent patterns and/or change from one configuration into another. The main theoretical notion is that new technologies create 'windows of locational opportunity'. As new technologies are not yet institutionally embedded, a new business system may emerge (Boschma and Frenken, 2006; Nelson and Nelson, 2002; Storper and Scott, 2007). This approach is, however, less useful in explaining change in mature industries, which are already institutionally embedded.

Instead, the evolution of a mature industry is expected to take place in 'punctuated equilibria', in which periods of slow, incremental change alternate with major shocks that shift the system to a new configuration once a tipping point has been reached (Boschma and Frenken, 2006; Crough, 2009; Hall and Thelen, 2009; Martin and Sunley, 2006). Business systems may change incrementally for a specific period of time. Development paths may subsequently be destructed if resources are exhausted, and/or if vested interests, rigidities of institutions and sunk costs result in a slow decline in innovation (Boschma and Frenken, 2006). On

the other hand, development paths may be renewed, resulting in new possibilities for old industries (Crough, 2005; Schneider and Paunescu, 2012).

Path renewal can be caused by a multitude of external shocks and internal factors. Exporting firms constantly bridge and broker across the boundaries of territorial business systems and global value chains (Kaufmann and Tödtling, 2001). When exporters enter new markets with or switch to other global value chains, they may experience conflicts with the territorial business system. This may stimulate them to reinterpret, combine or change local institutions. Territorial change may however also impact on global value chains. Policy reform may purposefully aim to change the local business system, while the uncoordinated action of multiple actors and the evolution of norms and values may lead to unintended changes (Hall and Thelen, 2009; Kingston and Caballero, 2009). New innovation policies and new local networks may for instance enable firms to switch global value chains (Humphrey and Schmitz, 2002). New technologies can also create a powerful urge for institutional change. For instance, the introduction of the Internet has radically changed the way that firms work both locally and internationally. Other changes arise when new local firms with different competences and strategies enter upon the scene (Martin and Sunley, 2006; MacKinnon, 2008). All these potential changes create tensions and inconsistencies within the multilevel business system. When the number of changes passes a threshold, it may result in path renewal or destruction (Crouch, 2005; Schneider and Paunescu, 2012).

I identify six potential internal causes of path renewal:

1. *Institutional reforms*, such as the end of communism in China (Kingston and Caballero, 2009; Williamson, 1995).

2. *Shifts in informal institutions*, such as a breach of trust among firm and non-firm actors (MacKinnon, 2008). Gereffi (2014) reports on paradigm shifts in global value chains, which have become more relational over time.

3. *New markets* bringing in new institutions and possibly creating institutional heterogeneity (Martin and Sunley, 2006). Domestic markets in emerging economies may offer an opportunity to innovate in different institutional environments, away from export markets dominated by lead firms of global value chains (Altenburg *et al*., 2008; Gereffi, 2014).

4. *Agency of non-firm actors*. Non-firm actors may deviate from the existing development path, possibly opening up new development paths. (Martin and Sunley, 2006; Rafiqui, 2009).

5. *Agency of firms*. Firms by definition operate in both a market and a broader institutional environment. As firms aim for profit, they may want to change

inefficient institutions standing in their way (Boschma and Frenken, 2011; Crouch *et al*., 2009; Hall and Thelen, 2009).

6. *Radical innovations*, such as e-marketing and just-in-time management (Boschma and Frenken, 2006; Nelson and Nelson, 2002).

6.3 RESEARCH METHODS

The research studies a unique case study of handicraft exporters in China's Commodity City and its hinterland. The dependent variables are product and process innovation. Product innovation is indicated by the perceived newness of products, and process innovations by the firm's strategic focus on production techniques, production methods and/or organisational structures (OECD, 2005). The indicators disentangle process innovation as a specific innovation strategy from process innovation as a necessary part of product innovation. The independent variable is the evolving institutional regime, which includes the business system, innovation system, firm strategies and competences and the institutional path dependence of the regime. The analysis is controlled for firm and entrepreneurial characteristics and subsectors. The indicators are detailed in section 3.3, but are slightly adjusted to Yiwu's specificities. First of all, various indicators of the institutional regime (i.e. the level of absorptive capacity, observations, knowledge spillover, clustering and knowledge exchange at trade fairs) are irrelevant in assessing whether Yiwu´s economy resembles a dependent economy and have therefore been used as a control variable instead. The responses on the indicator 'the level of trust in global buyers' is invalid and has been removed. Two indicators have been added: as part of the innovation system, a dummy variable has been created for the role of a 'designer' in global value chains. One indicator of firm strategies has been added as well: the use of 'synthetic materials', which indicates a firm strategy to reduce costs.

The research method combines a survey, semi-structured interviews and secondary data. A survey sample of 128 respondents represents suppliers in and around Yiwu, reflecting that Yiwu is the main distribution channel for Zhejiang firms (Ding, 2012). As only a few of the respondents scored high on product innovation in a randomly selected sample of 117 firms, I purposefully add 11 innovative firms identified by local government. As a result, product innovators are over-represented. Survey results are triangulated with a website search of firms and other qualitative data. In the process, 10 respondents were removed. The robustness of the model was improved by trimming five outliers (respondents #24, #48, #55, #72, #89). Table 6.2 presents the final sample.

Semi-structured interviews were conducted with 3 government officials, 3 academics and 13 CEO's of firms. Expert respondents were purposefully sampled based on secondary data and the opinion of respondents of the survey, in order to reduce the community bias. Semi-structured interviews provided in-depth information on the evolution of the roles of actors, strategies of global buyers, policies and regulations over time. Additional comments that respondents offered during the survey have been added to the qualitative dataset.

The study applies three methods of analyses. Firstly, a 'fuzzy-set ideal type' analysis (Fiss, 2007; Kvist, 2007) compares Yiwu's business system to an ideal type dependent economy and thus analyses whether the theoretical discourse is applicable to the case study or not. Its advantages, compared to a cluster analysis, are that it enables a comparison of an ideal type institutional regime (i.e. a dependent economy) to that of the case study and that it can make use of quantitative and qualitative data. The fuzzy-set analysis first assesses if the indicators score in line with expectation, as presented in the 'truth table' (table 6.1). The truth table includes those indicators on which dependent economies are expected to differ from other institutional regimes[7]. All indicators are included in the regression models. Subsequently, a membership score is calculated for each of the indicators and at an aggregate level, whereby the economy can weakly (up to 0.29), moderately (0.3-0.69), strongly (0.70 - 0.99) or fully resemble a dependent economy. Secondly, regression analyses assess if firms operating in institutional niches are more likely to innovate products. Given the categorical nature of product innovation, it is estimated by using ordered probit regression. Process innovation is a dummy variable, estimated by using a binary logistic regression. Finally, an evolutionary analysis traces the multilevel business systems and innovation outcomes over time. It assesses institutional path dependence and renewal.

[7] It includes all indicators of the business system, most of the innovation system, all on firm strategies and most control variables. Other indicators are excluded, because these do not vary between institutional regimes: the firms' roles in global value chains, the amount of knowledge acquired at trade fairs, the firms' absorptive capacities, firm age, entrepreneurial entities (age, gender, education, risk taking propensity) and the subsectors within which firms operate.

Table 6.1 Truth table

	Source	Scale	Truth table[1]	Main literature
BUSINESS SYSTEM				
Export share	Survey	0-100	>50[5]	Fabre, 2012; Lane, 2008; Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009; Schwab, 2015
Industrial policies	Qualitative	0-1	1	
Financial sector	Qualitative	0-1	1	
Trade unionism	Qualitative	0-1	0	
Collective bargaining	Qualitative	0-1	0	
Reliability institutions	Qualitative	0-1	0	
Local networks	Qualitative	0-1	0	
INNOVATION SYSTEM				
Knowledge of global buyer	Survey	1-5	>=4	Asheim and Isaksen, 2002; Asheim *et al.*, 2009; Crouch *et al.*, 2009; Gereffi *et al.*, 2005; Humphrey and Schmitz, 2002; Lundvall *et al.*, 2010; Whitley, 1992
Quasi-hierarchical value chain	Survey	0-1	1	
Innovation policies	Qualitative	0-1	0	
Knowledge local actors[2]	Survey	1-5	1	
Education/ training system	Qualitative	0-1	1	
FIRM STRATEGIES				
Outward innovation focus	Qualitative	0-1	0	Cohen and Levinthal, 1990; Dutrénit, 2004 and 2007; Gereffi *et al.*, 2005; Ornaghi, 2006
Use of own brand name	Survey	0-1	0	
Patenting dummy	Survey	0-1	1	
Use of synthetic materials	Websites	0-1	1	
INNOVATION LEVEL				
Process innovation	Survey	0-1	1	Edquist *et al.*, 2001; Utterback and Abernathy, 1975
Newness of products[3]	Survey	1-4	1	
CONTROL VARIABLES				
Firm: employment	Survey	4-15000	>=200	Eriskon, 2002; Hall and Soskice, 2001
Firm: turn-over (1,000 US$)	Survey	150-3mln	>=1,000	
Foreign owned firms	Survey	0-1	1	
Product-market combination[4]	Survey	1-3	1	

[1] Column indicates the expected outcomes in a dependent economy. [2] Knowledge exchange with traders, suppliers, chambers of commerce, business associations, cluster associations, government, universities and finance institutes is measured. This indicator correlates with the question on daily, weekly, quarterly, yearly, or less frequent interactions. [3]Categories are new to the firm, new to the territory, new to the sector, new to the world. [4] Ranging from low, to medium and high market segments. [5] Based on the global competitiveness report (Schwab, 2015), an export share of 30 percent is high in emerging economies.

Table 6.2 Survey sample by subsector and market segment

Market segment	Subsector								
	Plastic	Glass	Wood	Ceramics	Paper	Wickerwork	Metal	Combi-nation	Total
Low	18	0	3	0	8	8	0	9	46
Medium	10	3	19	2	0	11	3	11	59
High	1	0	2	1	1	3	1	4	13
Total	29	3	24	3	9	22	4	24	118

Source: survey results.

6.4 MAIN FINDINGS

6.4.1 THE INSTITUTIONAL REGIME

This section shows that Yiwu's institutional regime strongly resembles a dependent economy (table 6.3). This research finding is in line with the findings of Ernst (2007) on China's IT industry and Witt and Redding's (2013) findings on private family businesses. This section studies respectively the business system, innovation system, firm strategies and innovation outcomes.

The *business system* of the craft exporters strongly resembles a dependent economy (table 6.3). Its core indicator is a very high dependence on exports (82%), as compared to the average export dependence in emerging economies of about 25% (Schwab, 2015). Other scholars also note that Chinese family firms overly depend on foreign orders (Mitussis, 2010; Wang and Lin, 2013; Witt and Redding, 2013). By contrast, trade unionism and collective bargaining are very weak among craft exporters, which is in line with expectations in a dependent economy (respondent #4, 42, 129 and 131). In comparison with other emerging Asian economies, China scores above average in the Global Competitiveness Report on the role of institutions in supporting industry and on financial markets, whereby public institutions score highest. This indicates that national institutions create a moderately to strongly conducive environment for (export) industries (Schwab, 2015). The importance of financial institutions is associated with a significantly higher rate of borrowing by craft exporters, as compared to Cape Town and Yogyakarta. Semi-structured interviews furthermore reveal that industrial policies are in line with national ones and stimulate low-cost commerce and production through low taxes (respondent #100 and #128), tax rebates for exports (respondent #71) and subsidies for start-up firms. Local specificities

include the presence of the commodity market and an exceptionally supportive local government. These offer pull factors for low-tech suppliers and traders to locate in Yiwu (respondents #102, 104, 105, 130). The industrial policies, programmes and regulations therefore score as strong.

As expected, local networks and ties of trust are relatively weak. Contact between government, intermediary organisations and firms does not evolve around knowledge and production, but around mundane issues such as licensing and access to resources (respondent #1, 31, 107, 108, 122, 129, 131). Mitussis (2010) also reports that contact with government ('guanxi networks') for the most part is aimed at easing access to basic factors of production and markets, but not at exchanging knowledge. Business associations, which are part of the party-state apparatus, play an intermediary role in guanxi networks. The reliability of formal institutions is however higher than expected. They score relatively strong in the Global Competitiveness Report (Schwab, 2015) and this score has been applied.

The *innovation system* strongly resembles a dependent economy. It fully resembles a dependent economy in respect of the high importance that craft exporters attach to knowledge of global buyers and the relatively weak local innovation policies, programmes and regulations. The Global Competitiveness Reports mentions that China's insufficient innovation capacity is perceived as its most problematic factor in doing business (Schwab, 2015). While at a national level, innovation policies and programmes have become very ambitious, they are not geared towards low-tech industries (Choi *et al*., 2011; Fu *et al*., 2011; Tang and Hussler, 2011). Qualitative data furthermore reveals that local innovation policies for craft exporters are weak compared to the national average (respondent #129). Four instruments are relevant in the handicraft sector in Yiwu: improved rules of appropriation; subsidies; business development services; and a business incubator. Rules of appropriation have improved, following China's membership of WTO in 2001. The second policy instrument comprises subsidies for new machinery, product design, trade fairs, website development and branding. In practice, it appears to focus on machinery for cost reductions (respondents #4, #42, #61) . Third, firms are given access to Business Development Services, which also primarily aims for low-cost production (respondents # 4, #66, #132). Fourth, the China Yiwu Industrial Design Centre was set up as a business incubator for design firms. This benefits a small number of designers. Innovation policies are only partially implemented, which reduces their impact. Implementation agencies include government departments, business associations, platforms of SMEs and the China Yiwu Industrial Design Centre. On the other hand, China's education and training system score high compared to other emerging economies (Schwab, 2015).

Survey results furthermore show that local knowledge exchange with government and local firms moderately resembles a dependent economy, as entrepreneurs moderately value local knowledge exchange, while a weak score was expected (table 6.3). A robustness analysis confirms that firms value knowledge from global buyers significantly higher than knowledge from intermediary organizations such as universities, financial institutes and business associations. Other scholars are more sceptical about local knowledge exchange. Mitussis (2010) notes that firms prefer to hold knowledge private and Wang and Lin (2013) report that family businesses tend to keep knowledge within a very small circle of trusted persons, in order to prevent staff from copying or selling ideas, thus reducing opportunities to innovate. The study also anecdotally finds low levels of trust within firms. Salaried managers are often not trusted, many staff are lowly educated and not very committed to firms, and skilled staff prefers to set up their own business (respondent #105). Low levels of trust are clearly indicated by human resource management. Most labourers are migrants and stay for 10 months on the firm's premises. They receive a loan to cover expenses during their stay and a full salary at the end of the ten months. Employers perceive this to be essential in order to retain staff (respondent #6, #100). However, this evidence is too weak to ignore the moderate importance that entrepreneurs attach to local knowledge exchange.

The innovation system differs from a dependent economy in relation to the prevalence of (quasi) hierarchical global value chains. Contrary to expectation, most global value chains are relational and a mere 20% of all suppliers operate in (quasi) hierarchical global value chains. Qualitative data reveals that suppliers have on average 32 buyers.

Firm strategies strongly resemble a dependent economy as well. Firms tend to be inward-looking, focusing on process innovations. Almost 50% of all respondents apply for patents in order to protect their production processes and technologies and almost all firms undertake legal actions when large firms copy them. However, firms mention that application and control are complex within handicrafts. Copying by small firms is considered to be impossible to prevent (respondent #31 and #103). Contrary to expectation, however, forty six percent of all firms sometimes use their own export brand. Qualitative data reveals that they slightly adapt the client's design in order to sell products on Yiwu's wholesale market as well.

Finally, the high level of process and low level of product innovation strongly resemble a dependent economy.

Table 6.3 Membership scores of the dependent economy (from 0.0 to 1.0)

Sub-variables	Min	Max	Mean	Sd	Score
BUSINESS SYSTEM					
Export share	0	1	0.82	0,230	1,00[4]
Industrial policies	0	1	1,00		1,00
Strength financial sector	0	1	1,00		1,00
Trade unionism	0	1	0.00		1,00
Collective bargaining	0	1	0.00		1,00
National/ local production networks	0	1	0,00		1,00
Reliability formal institutions	0	1	0,70		0,70
INNOVATION SYSTEM					
Perceived importance global buyers	1	5	4,40	0,859	1,00[3]
(Quasi) hierarchical value chains	0	1	0,20	0,304	0,20[1]
Innovation policies, programmes, regulation	0	1	0,00		1,00
Education and training system	0	1	1.00		1.00
Importance of local/nat knowledge networks	1	5	2,43	1,162	0,55[1]
FIRM STRATEGIES					
Strategic focus: outward(dummy)	0	1	0,00		1,00
Brand name in exports	0	1	0,46	0,501	0,54[2]
IPR strategy: taking protective measures	0	1	0,947	0,186	0.95[4]
INNOVATION					
Product	1	4	1,53	0,779	0,70[1]
Process	0	1	0,51	0,512	1.00[5]
CONTROL VARIABLES					
Product-market combination	1	3	1,77	0,778	O,59[1]
Firm: employment	4	15000	324	1530	1,00
Firm: turn-over (US$ 1000)	150	3 mln	45 427	176098	1,00
Foreign-owned firms	0	1	0,27	0,446	0,27
Mean score					**0,85**
Observations			118		

[1] Score of 1 expected. [2] Score of 0 expected. [3] Score of 4 or 5 is expected. [4] Score above 0.25 is expected. [5] Scores above 0.5 are expected, as not many firms tend to focus on process innovation.

6.4.2 VARIATION AMONG CRAFT EXPORTERS

Firms within the dependent economy may adopt different innovation strategies and develop different competences (table 6.4). The most common innovation strategies are imitating (i.e. reducing the costs and risks of innovation) and price fighting (i.e. reducing costs through process innovation). Only a small and over-represented number of firms operates as designer or innovator. The subsequent section shows that these four categories differ significantly (table 6.5).

Table 6.4 Innovation strategies

		Level of product innovation		
		Low[1]	High[2]	Total
Level of process innovation	Low	*Imitators* 45% (n=53)	*Designers* 5% (n=5)	49% (n=58)
	High	*Price fighters* 44% (n=52)	*Innovators* 7% (n=8)	51% (n=60)
	Total	89% (105)	11% (n=13)	(n=118)

[1] Low entails a score of 1 or 2 on a Likert scale from 1 to 5.
[2] High entails a score of 3 to 5 on a Likert scale from 1 to 5.

On average, craft exporters tend to have a low to very low level of product innovation (table 6.5). In fact, only 11 % of all sampled firms have a medium or higher level (table 4). Respondent # 72 notes:

> 'Innovation is not important for Chinese import and export companies. We just follow customer instructions'.

Qualitative data shows that imitators and price fighters with a very low level of product innovation avoid investment in product innovation altogether, while those with a low level employ a few designers in order to adjust product designs for sales at arm's-length in the commodity market (Respondent #3, 22, 32 and 91). The designers make minor adaptations in order to ensure that IP rights are not violated downright. By contrast, design firms strategically focus on product innovation, while a small group of firms combine process and product innovation (called innovators in table 6.4). The last group includes respondent #107, who has established a design team to develop new paintings and adjust designs from the

Internet. The design team is supported by part-time designers with their own workshop. To ensure a sufficient number of designers, the firm cooperates with art universities in China. The paintings are subsequently mass produced.

Roughly half of the firms opt to strategically focus on process innovation. Most of these firms are price fighters, who constantly innovate production processes in response to growing competition, labour shortages and rising labour costs (respondent #1 and #126). Respondent #126 is probably most innovative in production processes:

> 'I am always the first to innovate in Yiwu. The first to buy machines, the first to buy the flower moulds, the first to put them in a pot and the first to develop my own pressing machines for artificial flowers'.

New machines, which were initially bought abroad, are increasingly locally produced and incrementally innovated. By now, some machines are being sold in the local market.

Research findings show that the firms are strongly dependent on exports. Most export-dependent firms operate in low to medium-priced market segments, within which the use of synthetic materials is common. Price fighters are most export-dependent and operate in the lowest market segments, enabled by cost-reducing investments. Imitators are slightly less dependent on exports and operate in slightly higher market segments, because they have foregone cost-reducing investments. The findings show that most of these firms operate in relational global value chains, and that more than half depend on brands of global buyers. By contrast, designers and innovators are significantly less dependent on exports. They are more likely to be subsidiaries of firms, to use natural materials, operate at the high-end of markets, and to employ a higher percentage of highly educated entrepreneurs and trained staff (table 6.5). Qualitative data reveals that the parent company tends to originate from Hongkong, Beijing or Shanghai.

Table 6.5 Descriptive statistics

	Mean	Sd	Min	Max	Imitator	Price-fighter	Designer	Innovator
Export share	82,64	23,0	0	100	82***	89***	58***	60***
Quasi-hier. chain	,13	,334	0	1	,11	,17	,00	,00
Foreign-owned	,07	,253	0	1	,06***	,00***	,60***	,25***
Brand in exports	,46	,501	0	1	,48***	,30***	1,00***	1,00***
Higher education entrepreneur	,59	,493	0	1	,44**	,67**	,80**	,88**
Training	,71	,455	0	1	,61*	,76*	1,00*	1,00%*
Product-market segment[1]	1,77	,788	1	4	2***	1***	3***	4***
Synthetic materials	0,33	0,471	0	1	0,25**	0,46**	0,00**	0,12**
Designer	,04		0	1	,00***	,00***	1,00***	,00***
Product innovation[2]	1,53	,779	1	4	1,45***	1,17***	3,40***	3,25***
Process innovation[3]	,51	,512	0	1	,00	1,00	,00	1,00
Observations	118				53	52	5	8

* p < 0.1, ** p < 0.05, *** p < 0.01 (ANOVA) [1] Price segment:0=low;1=medium;3=high;4=high niche market. [2] Product innovation: 1=new for firm; 2-new for region; 3=new for country; 4=new for world. [3] Homogeneity-of-Variance test not passed.

Table 6.6 Pearson correlations of predictor variables of innovation

	2	3	4	5	6	7
1 Synthetic material	-,271**	,168	,097	-,058	-,085	,032
2 Brand name in exports		-,111	-,041	,144	-,023	-,041
3 Quasi-hierarchical chains			,084	-,076	-,108	,033
4. Subsidiaries				-,196*	-,068	,028
5 Designers					-,026	,176
6 Training						,143
7 Higher education entrepreneurs						

*. Pearson correlation is significant at the 0.05 level (2-tailed).
**. Pearson correlation is significant at the 0.01 level (2-tailed).

6.4.3 INNOVATION OUTCOMES OF CRAFT EXPORTERS

A regression analysis reveals that product innovation depends on institutions that are at odds with the main institutional regime. The odds of product innovation increase when firms operate in relational global value chains, use their own brand at times and operate as designers and/or subsidiaries of multinationals. By contrast, the odds of process innovation increase when firm strategies focus on low price segments (indicated by the use of artificial material), and when firms have more competences (table 6.7).

Table 6.7 Regression models

	Process innovation[1]	Product innovation[2]
Quasi-hier. global value chain		-1,929 (1,079)*
Subsidiary		2,031 (0,882)**
Designer (dummy)		1,981 (1,164)*
Brand name in exports (dummy)		0,943 (0,454)**
Synthetic material	1,117 (0,453)***	
Higher education	0,802 (0,416)**	
Training	0,843 (0,466)*	
Observations	109	89
Pseudo R^2 (Nagelkerke)	0,166	0.320

Notes: Due to multicollinearity, the market segment and firm strategies have been excluded. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. [1] Process innovation is estimated in a logistic regression model. [2] Product innovation is estimated in an ordered logit regression

A qualitative analysis explores why product innovation is rare within the institutional regime. Firms consider product innovation to be risky, because global buyers wish to retain brands, designs and markets and do not support product innovation, local knowledge exchange is limited (respondents #104 and #105), entrepreneurs are risk-averse (GuaHua, 2000; Si, 2014; respondent #105); and it is hard to attract good designers (respondent #105 and #106). A further analysis reveals that product innovators appear to operate in an institutional niche or show agency. Design firms operate within an institutionally sheltered niche: the China Yiwu Industrial Design Centre offers free accommodation and tax exemptions and the parent companies of the design firms offer regular and steady design orders. Their linkages with local firms outside the centre are very weak. Other firms absorb the innovation risks in another way. Seven firms share them within relational value chains. In contrast to most respondents, they are able to enter

relational value chains, because they have balanced competences (table 6.7), specialised skills and specialised networks. They cater to the Japanese markets, as the firm owner speaks Japanese (respondents #83 and #92), the French market as the owner lives in Paris (respondent #76) or the highest price segment of the national market with occasional exports, based on specialised technical skills (respondent #1 and #125). Finally, two very large first movers absorb innovation risks internally, owing to their large market share and accumulated financial reserves. They tend to experiment with product innovation, without doing away with their mainstream low-cost exports.

6.4.4 EVOLUTIONARY ANALYSIS

Institutional path dependence

This section discusses if the present institutional regime can be explained based on its history. The study findings show that two initial institutions have had an irreversible and strong effect on the institutional regime of the craft exporters. The first is the high level of entrepreneurship of Yiwu's firms in low product-market segments. For ages, Yiwu had been a poor, rural area, where families survived by peddling. People picked up their shoulder poles and travelled great distances in order to barter locally produced brown sugar (Qi, 2000). They did not invest money into their business, kept their costs to a minimum and made small profits. A few peddlers even continued during the communist period, at great personal risk (GaoHua, 2000, Si et al., 2015, Qi, 2000). Yiwu entrepreneurs were among the first to start producing and trading once communism gradually faded out around 1980 (GaoHua, 2000). According to respondent #105, the entrepreneurial culture has hardly changed and he notes:

> 'The typical handicraft firm is a family business. The father is CEO and the mother is the administrator. They adopt a traditional business model.'

The businesses still are often managed by the father of the family and the mother tends to work as administrator. This finding corresponds with survey results: there is a very high percentage of male entrepreneurs (92.4 percent), 73 percent of all firms are owned by local family businesses, the level of process innovation is high and 97 percent of all firms operate in low product-market segments. Futhermore, the study observes that in many firms the wives of the entrepreneur worked as well. Finally, the path dependence of entrepreneurship corresponds with findings in literature (Mitussis, 2010; Wang, 2013; Witt and Redding, 2013).

A second initial institution which is still found today is the low levels of trust among local actors. The 'guanxi systems', whereby firms depend on government for access to government-controlled resources, and the repression during communism are likely to explain a certain level of mistrust among local actors (Mitussis, 2010; Wang, 2013; respondent # 129). This in turn may explain the reinforced moderate levels of local knowledge exchange over time.

Path renewal

Institutional path dependence has formed the institutional regime and restrained its possible development paths. Within these constraints, the development path has been renewed twice over the over the past five decades (table 6.8). As the table shows, the coordinating role of international, national and local institutions and actors in the market economy has incrementally increased over time (Yueh, 2013) and firm strategies and innovation outcomes have changed accordingly.

The first phase describes the period of communism. Based on the descriptions of Yiwu's economic history by GuaHua (2000), Si et al. (2015) and Qi (2000), a picture emerges of a very small number of forbidden, isolated and hidden private producers and traders selling low-quality products locally. Institutions enabling a market economy were close to absent, which is reflected in the low memberships score of market economies in general. Based on the descriptions, it is assumed that product and process innovations were close to absent as well. After all, the incentives, competences and networks that condition firms to innovate were all missing. The absence of institutions in support of market economies and the weakened vested interests of a socialist economy created fertile ground for path renewal, as described below.

Following the gradual end of communism in China, a local market economy emerged (phase 2, table 6.8). In the late 1970s and early 1980s, Zhejiang province was among the first in China to offer opportunities for private firms. In line with its history, a small-commodity trading market spontaneously emerged in 1982. The city council discussed the matter and decided to formalize the market in 1984. Around the same time, the market economy of neighbouring Wenzhou was getting off the ground as well. It took years for industrial policies to allow for long-distance trading, but slowly local industrial policies created a more enabling environment (GaoHua, 2000). At the same time, however, the national and local government maintained strong control over resources (Mitussis, 2010). Industrial policies, programmes and regulations, as well as financial institutions, were slowly but surely established, while trade unionism and collective bargaining were still weakly developed in handicraft exports. Following a sustained period of communism, formal institutions in support of a market environment also earned a

moderate level of reliability among private firms (Yueh, 2013). In short: a business system for was being formed enabling local economic development.

Table 6.8 Evolving institutional regimes[1]

Variables	Phase 1: Pre-phase[2]	Phase 2: Local market-economy[3]	Phase 3: Dependent economy[4]
BUSINESS SYSTEM			
Export share	0.0	1.0	1.0
Industrial policies	0.0	0.5	1.0
Strength of financial sector	0.0	0.5	1.0
Trade unionism	0.0	1.0	1.0
Collective bargaining	0.0	1.0	1.0
Importance of local networks	0.0	0.5	1.0
Reliability of formal institutions	0.0	0.5	0.7
INNOVATION SYSTEM			
Perceived importance global value chains	0.0	1.0	1.0
Quasi hierarchical global value chains	0.0	1.0	0.2
Innovation policies	0.0	1.0	1.0
Education and training system	0.5	0.7	1.0
National/local knowledge networks	0.0	0.5	0.5
FIRM			
Outward strategic focus	0.0	0.0	1.0
Brand name	--	1.0	0.5
IPR strategy	0.0	0.0	0.9
CONTROL VARIABLE			
Firm size	--	0.5	1.0
Foreign owned firms	0.0	1.0	1.0
Product-market combination	1.0	0.0	0.7
INNOVATION			
Product	0.0	0.5	1.0
Process	0.0	0.5	1.0
Mean score	**0.08**	**0.63**	**0.85**

[1] Scores are standardised as absent, weak, moderate, strong, full. [2] Sources: GaoHua, 2000; Si *et al*., 2015; Qi, 2000. [3] Sources: Ding, 2012; Forste, 2000; GaoHua, 2000; Si *et al*., 2015; Wang, 2008. [4] Data is adapted from table 8 in order to ease comparison with previous periods.

The innovation system received less attention at this moment in time, but significant improvements in the quality and quantity of the education and training system enabled firms to build up their competences (Yueh, 2013). In this slowly emerging institutional regime for a local market economy, local peddlers moved on. They knew the domestic market and were able to offer an increasing number and variety of low-cost products to consumers in Zhejiang province and beyond. When needed, producers and traders networked in order to service customers. At the same time, they closely observed each other at the wholesale market in order to copy each others' designs. This demanded outward-looking firm strategies, whereby firms incrementally adjusted and produced low-cost products for the very large but poor local communities. Based on the firm descriptions and type of products that were produced at the time, a moderate level of product and process innovation can be assumed (Ding, 2012; Forste, 2000; Si *et al*., 2015).

Yiwu became the largest wholesale commodity market in China in 1991 and continued its explosive growth during the 1990s. National and local policies, programmes and regulations, combined with a growing financial sector, increasingly enabled a market economy (Yueh, 2013) and the local government constantly upgraded the commodity market in order to deal with the growing number and variety of goods and firms. The build up of the business system explains the 'moderate' scores for policies and financial services given in table 6.8. During this phase, product and process innovation resulted in the diversification of products for the growing domestic market. The success of the commodity market and industrial policies started to attract stall-holders from all over the province. At first, stall-holders only traded, but since the mid-1990s they have started using their accumulated capital, to set up mass-producing factories (Ding, 2012). The sheer number of buyers, labourers, materials and capital created significant externalities, which became the driving force of a massive industrialisation process (Wang, 2008).

Phase 3 started around the year 2000 (see section 6.4.1 for a description of indicators. This section instead describes its evolutionary process). As Yiwu's firms increased their scale of production, improved quality standards improved and diversified markets, firms acquired enough productive capabilities to export. The focus on low-priced products for price-conscious consumers enabled Chinese traders and suppliers to explore new international low-priced market segments. Exports increased rapidly since the late 1990s and craft exporters became increasingly dependent on foreign orders. International dependence was complemented by a weak to moderate local institutional arrangements: a low level of trade unionism and collective bargaining, weak knowledge exchange in guanxi networks and low levels of trust between employers and employees (Mitussis, 2010; Wang and Lin, 2013; respondent # 6, 100, 105). Around this time, Yiwu's

success in exports became seen as an example for other small cities in China (Si *et al*., 2015). In 2004, this resulted in the official proclamation of Yiwu as 'China Commodity City' (Ding, 2012). Exports had a significant effect on firms in China's Commodity City, as it led to their integration into global value chains (Bellandi and Lombardi, 2012). Various traders and suppliers entered into relational or (quasi) hierarchical global value chains, instead of selling at arm's-length at the commodity market (Ding, 2012). Firms stopped designing and marketing, as global buyers offered designs, brands and markets (respondents #1, #25, #31, #68, #95). In the Yunhe cluster of wooden decorations and toys, for instance, respondent #31 explains:

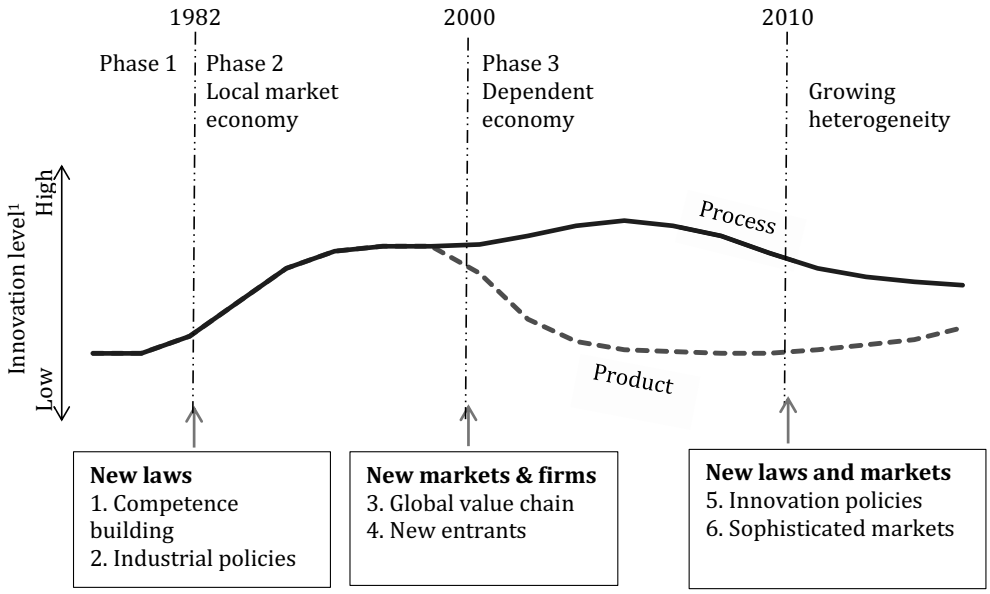
> 'In the past, we produced our traditional design of wooden blocks. From 2000 onwards, big clients started to look for suppliers. Then we only had to offer quality and improve delivery time. We no longer designed products ourselves and many designers left'.

Integration into global value chains led to industrial downgrading, and, as a consequence, innovative capacities of firms reduced. Firms now inwardly focused on process innovations in order to reduce production costs in competitive low-cost market segments.

Since 2010, the regional government of Zhejiang and local government in Yiwu have recognized that the level of product innovation has fallen far below that of neighbouring regions, such as Shanghai, and have therefore established ambitious plans to rapidly increase the R&D expenditure of small firms. Its strategies included opening the China Yiwu Industrial Design Centre in 2012 (respondent #131). At the same time, a few firms show agency in the light of growing competition and saturated markets. The local market is increasingly seen as a 'blue sea strategy', but it also demands product innovation and balanced competences (respondent #104, 105; 125, 129). As a result, it appears that gradually more firms innovate products.

Figure 6.1 summarizes the evolutionary change as discussed above. As can be seen, the main factors causing the development path to renew are institutional reform, opening up export markets and the entrance of new firms. Initially, path renewal was furthered by the weak institutions in support of markets during communism.

Figure 6.1 Evolutionary change of handicrafts in China's Commodity City



[1] Innovation levels are estimated based on qualitative data and are illustrative.

6.5 Discussion

This section explores the results of the case study in relation to past studies on multilevel, multi-spatial and dynamic institutional regimes and their impact on innovation. I highlight four issues for discussion.

The first issue relates to the multi-spatial dimension of institutional regimes. Study results show that the institutional regime within which Yiwu's craft exporters operate and innovate is not just influenced by national institutions and actors, as is the modus operandi of research on comparative capitalism, but also by international and local institutions and actors. Especially the integration into and governance of global value chains condition innovation outcomes. The regression analyses show that (quasi-) hierarchical global value chains are likely to reduce product innovation, confirming the impact of global value chains on innovation (Gereffi *et al*., 2005; Humphrey and Schmitz, 2002; Saliola and Sangfei, 2009). Furthermore, the evolutionary analysis shows that the sudden increase in exports during the early 2000s has reduced product innovation of craft exporters. Case studies on exporters of denim jeans in the Dominican Republic, furniture in South

Africa and leather-shoes in the Sinos Valley in Brazil confirm that export dependence may result in industrial downgrading (Kaplinsy and Morris, 2001; Meyer-Stamer, 2004). These findings show that international integration of a local economy may affect product innovation outcomes negatively.

Furthermore, the research findings show that local institutions and actors condition innovation outcomes as well. Firstly, the study results show that initial local institutions have limited the possible development trajectories of craft exporters and hence the possible innovation outcomes. Over the past 50 years, it has been a given that Yiwu's craft exporters aim for low cost-market segments, levels of entrepreneurship in family firms are high and levels of trust among local actors are low (Mitussis, 2010). Such informal local institutions are known to change very slowly (Williamson, 2000; Rafiqui, 2009). Secondly, more recent attractive local industrial policies and programmes, including the development of a commodity market for low-cost wholesale product, has attracted producers of low-tech products from all over Zhejiang province (Ding, 2012; Forste, 2000; GaoHua, 2000; Si *et al*., 2015; Qi, 2000). At the same time, relatively weak local innovation policies and labour market practices are likely to hamper product innovation. The complementarity of initial institutions and industrial policies reinforce low cost production and process innovation. However, the recent establishment of the China Yiwu Industrial Design Centre has created a small institutional niche within which designers are able to innovate products. This example shows anecdotally that a niche can enable innovation in an otherwise averse institutional regime (Geels, 2004; Strambach and Storz, 2008). More research is needed in order to assess if institutional niches, such as incubators, may stimulate innovation within dependent economies.

At the same time, national institutions and actors remain of importance. For instance, the incremental policy reform towards a market economy has led to the emergence of Yiwu's local market economy, and the regression analysis shows that education and training increases the odds of process innovation.

The second issue for discussion relates to the dynamics of the institutional regime, arguing that institutions and actors co-evolve across spatial levels. The study has shown that Yiwu's business system has evolved from a premature (communist) economy, to a local market economy and finally a dependent economy, and that these changes coincide with changes in innovation outcomes. Such an astounding path renewal contradicts the notion that institutional rigidities and vested interests result in path dependence in mature industries such as handicrafts (Boschma and Frenken, 2006; Martin and Sunley, 2006). Schneider and Paunescu (2012) similarly found regular change in Eastern European business systems.

These findings highlight the need to better understand how institutional regimes evolve over time and when they reach a tipping point (Martin and Sunley, 2006).

The study shows anecdotally how the co-evolution across spatial levels may create institutional dynamics and heterogeneity. Firstly, it finds that a local industry may experiment with different institutional arrangements within a national regimes. The case study shows that Yiwu was among the first to experiment with a market economy, after which other territories followed and that designers experiment with product innovation within an institutional niche. Secondly, the research findings show that specific local institutions and actors can push the development path into a unique direction, which differs from the national one. Small initial differences may lead to great differences over time (Martin and Sunley, 2006). The case study shows concretely that Yiwu's direction of development has slowly been skewed towards process innovation and imitation of low-cost exports. Furthermore, the evolutionary analysis shows that the national and local institutional regimes create pre-conditions for exports. Once firms start exporting, however, global value chains may strongly impact on innovation outcomes and create a dependency. This reduces the subsequent impact of the national and local institutional regime on innovation outcomes, and hence reduces the ability of national and local policy makers to influence future development trajectories.

A third discussion relates to the multilevel analysis of institutional regimes and in particular the variety of firm strategies within institutional regimes (Boschma and Frenken, 2011; Geels and Schot, 2007; Hodgson, 2009; Rafiqui, 2009). I find that only a few firms innovate products, suggesting that Yiwu's dependent economy strongly conditions innovation strategies of firms. In fact, product innovators are so rare, that I was forced to purposefully sample them. The findings show that designer firms operate in an institutional niche: the China Yiwu Design Centre, as a local actor, and parent companies, as international actors, jointly offer a sheltered institutional arrangement which enables product innovation. Other product innovators manage their innovation risks by collaborating in relational global value chains and/or by using their huge financial reserves (see also Altenburg *et al*., 2008; Asheim *et al*., 2009; Gereffi *et al*., 2005; Pietrobelli and Rabellotti, 2011). As expected, these firms have balanced competences, which are needed to constantly reposition themselves in international and local markets (Dutrénit, 2007; Teece, 2007).

A fourth issue for discussion relates to the unexpected finding that most firms depend on knowledge from global buyers, as embodied in brands, markets and product designs, but they nevertheless operate in relational global value chains. This appears to be at odds with the global value chain perspective (Gereffi *et al*., 2005). This atypical situation is most likely caused by three factors: (1) Firms tend

to combine quasi-hierarchical, relational and arm's-length modes of governance, which waters down differences; (2) the presence of thousands of buyers reduces the risk of switching between global value chains, and hence reduces captivity as found in quasi-hierarchical chains; (3) intense local competition and oversupply in the commodity market lead to strategies of cost reductions, irrespective of the governance of global value chains. In conclusion, the findings show the presence of thousands of buyers enables suppliers to enter relational global value chains, whereas intense local competition creates incentives for skewed process innovations. Therefore, I conclude that local institutions and actors mediate the impact of global value chains on innovation, as also discussed by among others Coe *et al*. (2004) and Henderson *et al*. (2002).

6.6 CONCLUSIONS

This chapter aims to explain skewed process innovation of craft exporters in China's Commodity City from the perspective of a multilevel, multi-spatial and dynamic institutional regime. It has applied a mixed methodology, whereby the multilevel business system is described and compared with an ideal type dependent economy and with previous business systems, and innovation outcomes are compared at one moment in time and across time. As a small and unique case study, the results should be treated with care.

The first conclusion is that multi-spatial institutional regimes may explain skewd process innovation of Yiwu's craft exporters. Dependent economies are likely to lead to skewed process innovation, because dependence on sales and knowledge of global buyers in low priced market segments in combination with weak to moderate local institutions conditions firms to reduce production and/or innovation costs (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009). The findings show that local suppliers primarily exchange knowledge within global value chains, while local knowledge exchange is moderate.

The second conclusion is that a multilevel perspective of institutional regimes enables a study of variety within. The results show that firms may adopt different strategies within the confines of a dependent economy. The study furthermore finds that designer firms operate within an institutional niche, within which they can innovate products at relatively low risk. Generally speaking, the concept of niches is used to explain innovation in high-tech sectors (Geels, 2004), but I find its application to low-tech sectors insightful as well.

Third, the dynamics of institutional regimes illustrate why Yiwu's dependent economy has emerged. The chapter also illustrates that mature industries in emerging economies can change relatively rapidly and radically, contradicting the assumption that institutional rigidity and vested interests in mature industries result in stability or decline (Boschma and Frenken, 2006; Martin and Sunley, 2006). The study identies two interwoven processes: two initial, informal institutions have proven to be path-dependent, resistant to change, irreversible and self-reinforcing. This has limited the potential development trajectories of the institutional regimes. At the same time, path renewal can be triggered by changes in the national business system (such as new laws and regulations), the local business system (such as new laws, regulations, markets and firms and/or the agency of local actors) and global value chains (new markets and firms). The resulting evolutionary processes are non-linear but confined to a limited number of options.

Research findings show that the incentives for product innovation are presently increasing in Yiwu due to a grown sophisticated demand, innovation policies, firm agency and the presence of the China Yiwu Industrial Design Centre. This finding may indicate that heterogeneity with the institutional regime increases once again. On the other hand, innovation policies primarily target high-tech sectors and firms still prioritise process innovation and imitation. The policy focus on high-tech sectors is unfortunate, as innovation in low-tech sectors can be the dynamic engine of economic growth and learning (Lundvall *et al*., 2002; Moodysson and Martin, 2011; Scott, 2006). It remains as yet unclear if and when a tipping point towards more innovate craft exports will be reached.

The above conclusions lead to two recommendations. First, I recommend more research on the effects of multi-spatial, multilevel and dynamic institutional regimes on innovation. Generally speaking, scholars assume that institutional regimes are set at a national level and are relatively stable over time. However, I find that they are multi-spatial and can change radically over time. Relevant research questions are: How do the spatial and institutional levels of institutional regimes co-evolve and cause path renewal? When is a tipping point reached?

Second, I recommend more study on institutional niches. The research findings show that product innovation is hard to achieve in a dependent economy, because firms would require different competences and networks. Institutional niches may allow a small group of (new) firms to experiment with product innovation. However, more study is needed (Geels, 2004).

7 COMPARATIVE ANALYSIS

ABSTRACT

This chapter conducts a configurational comparative analysis of incremental innovation of craft exporters in Yiwu (China), Yogyakarta (Indonesia) and Cape Town (South Africa). It first describes and compares their institutional regimes, concluding that these differ significantly. The chapter subsequently shows that differences in institutional regimes explain differences in the firms' levels of product and process innovation. Third, the chapter aims to show how the space-specific evolution of institutional regimes may result in territorial variety and hence in differences in innovation outcomes between territories. The analysis shows that institutional path dependence is likely to limit the development trajectories that handicraft exporters within each case study can take. Within these constrained development trajectories, periods of relative stability are intertwined with outbursts of path renewal. This finding is surprising, because path renewal in mature industries, such as handicrafts, is expected to be hindered by institutional rigidity, vested interests and sunk costs.

7.1 INTRODUCTION

The previous chapters have analysed the incremental innovation of craft exporters in Yiwu, Yogyakarta and Cape Town. The chapters have shown that the three case studies have starkly different innovation processes and outcomes, which have been analysed from different academic perspectives. In Yogyakarta, firms innovate products and processes by combining global and local knowledge. In Cape Town, formal firms innovate products by extensively exchanging local knowledge, while informal firms hardly innovate at all. In Yiwu, firms innovate production processes by absorbing knowledge from global buyers. The Yiwu case study combined three academic perspectives[8] into one exploratory framework, as presented in greater detail in section 2. Due to the exploratory multiple case study strategy, however,

[8] The perspectives are: innovation systems, business systems and path dependence.

this exploratory framework has not fully been applied to the case studies on Yogyakarta and Cape Town. This chapter aims to overcome this weakness.

This chapter compares the three case studies, and in particular assesses how their different institutional regimes affect incremental innovation of handicraft exporters in emerging economies. A fuzzy-set analysis compares the case studies to each other and to theoretical ideal types. A regression analysis subsequently assesses the impact on innovation of the different contemporary institutional regimes. A second part of the analysis aims to appreciate how the different institutional regimes and their innovation outcomes came into existence. It adopts an institutional path-dependence perspective by unearthing the evolutionary processes that jointly influence the innovation behaviour of firms (Nelson and Winter, 1982). It views evolutions from the perspective of institutional hysteresis, whereby the slow change of institutions most of the time results in path dependence, while shocks, market dynamics and small institutional changes may periodically result in path renewal (Martin and Sunley, 2006).

Institutional regimes are defined as a set of similarly featured rules and networks and the actors that produce and reproduce them (Crouch, 2005: 23). The rules and actors are seen to be multilevel, multi-spatial and dynamic (see chapter 2). To my knowledge, such a perspective in international comparative innovation studies is novel. *Multilevel* institutional regimes incorporate higher and lower order institutions, whereby higher level institutions set the playing field for lower level institutions (Amable, 2000; Helmsing, 2013; Rafiqui, 2009; Williamson, 2000). The highest level of institutions is the business system, that is: the systemic coordination among actors impacting on the local economy (Hall and Soskice, 2001; Whitley, 1992). This sets the scene for the innovation system: the systemic interaction of knowledge among firms, intermediary organisations and government (Tödtling *et al*., 2009). The third layer comprises firm strategies and competences. The relevance of the multilevel perspective lies in its ability to explain variation within institutional regimes and in the amalgamation of the business and innovation systems perspectives, which both aim to explain innovation but have drifted apart (Fagerberg, 2005).

Institutional regimes are also *multi-spatial*, because international, national and local institutions and actors are expected to affect the firms' level and type of innovation. Generally speaking, scholars on institutional regimes study the national level, but a multi-spatial level is recommended by among others Coe *et al.* (2004), Crouch *et al.* (2009), Dicken *et al.* (2000), Geels (2004), Henderson (2004), Lane (2008), Nölke and Vliegenthart (2009), Schneider (2009).

Finally, institutional regimes are expected to be *dynamic,* because space-specific historical processes form and reform institutional regimes within a territory (Dosi

and Marengo, 2007). Institutional regimes are known to change over time, resulting in changes in the firms' innovation levels and types, but their dynamics are under-studied (Boschma and Frenken, 2015).

The chapter applies the exploratory model detailed in section 2.5. Section 7.2 offers a brief literature review on the comparative institutional advantages and innovation in handicrafts. It shows that innovation is of increasing importance. Section 7.3 presents the research methods. Section 7.4 subsequently presents the main findings related to the contemporary institutional regimes and section 7.5 in relation to its dynamics. Section 7.6 discusses the findings, followed by conclusions and recommendations.

7.2 BACKGROUND: INNOVATION IN HANDICRAFTS

Before assessing the institutional regimes governing innovation in handicraft exporters, it is worthwhile to consider the specificities of handicraft exports. Nelson and Nelson (2002) argue that the complexity, cumulativeness and appropriability of technologies of a sector condition innovation processes (Nelson 1994 and 2002). For instance, the sector of life sciences uses relatively complex technologies and may therefore require territorial institutions and actors such as R&D institutes, medical schools and IPR rights. By contrast, the handicraft industry does not use very complex technologies and may therefore require other institutions and actors. What are the specificities of handicraft exports?

Handicrafts are a low-technology sector, with a relatively low complexity and weak rules of appropriation. These features enable a comparatively fast flow of knowledge and low entry barriers. Therefore, handicraft exports tend to be a sector within which firms in developing economies may first enter international markets. However, over the past decades the importance of knowledge accumulation has increased, due to shorter product cycles, higher product and service standards, and the amplified use of technology and design. The sector is increasingly influenced by trends in interior design and fashion. Thereby, a premium is offered for products that are new, distinctive and responsive to quickly changing market trends and market niches. In low-priced market segments, it has become of increasing importance to reduce costs by creating advantages of scale, whereas high priced market segments in particular look for unique product designs.

Territories which have accumulated knowledge increasingly have a comparative institutional advantage. Cape Town, Yogyakarta and Yiwu have accumulated

knowledge, and therefore have been able to carve out markets. Firms in Yiwu export in low-priced market segments, which have grown rapidly over the past decades. Firms in Yogyakarta flexibly produce contemporary 'warm' Javanese designs in medium-priced market segments. Competition in this niche market is primarily limited to Thailand and the Philippines (respondent #1, 5 and #53). Firms in Cape Town serve niche markets for high-priced arty African and contemporary design. It is arguably the world leader in African contemporary design. Firms in Yogyakarta and Cape Town benefit from the growing demand for ethnic, pure and hand-made design in higher-priced market segments.

Over the past decades, institutional regimes that stimulate firms to innovate have become of increasing importance, because global value chains increasingly demand craft suppliers to innovate. I identify four separate trends based on Gereffi (2014). First, the international craft market has become increasingly diversified and fragmented, with a growing number of products for specific target groups. Demand has regionally diversified, due to an increase in sophisticated demand from the urbanizing middle classes in emerging economies. For instance, research findings show that potters in Yogyakarta design Javanese vases for the local market, colourful vases with inlays of glass for the Indian market and vases in contemporary, natural colours for the German market. Diversification and fragmentation enables craft exporters to service a large number of global buyers and to switch between global value chains at a lower risk than in markets controlled by only a few global buyers. A second, related trend is that global value chains have become more relational, as compared to the (quasi-) hierarchical global value chains of the 1960s and '70s (Gereffi, 2014). The research findings show that 86 percent of all respondents operate in relational global value chains servicing an average of 24 global buyers each. Only 14 percent of all firms operate in (quasi-) hierarchical global value chains. In relational global value chains, suppliers have more innovation opportunities than in (quasi-) hierarchical global value chains (Gereffi *et al*., 2005). A third trend is that innovation risks have reduced due to the codification of knowledge and relatively low investment costs of managerial and market innovations (Gaul, 2010). The research findings show that suppliers highly value knowledge sourced from the Internet and trade fairs. Managerial and market innovation are as important as product innovation: they enable firms to reduce costs and/or to improve services and quality. A fourth trend is that global buyers have partially relocated product design to emerging economies with a tradition in ethnic design. This offers new opportunities for territories with comparative institutional advantages in ethnic design (Scott, 2006; UNCTAD, 2010).

In summary: international trends in handicraft markets point towards a greater need of and opportunities for innovation. As the sector becomes more knowledge-

intensive and trend-conscious, territories and firms increasingly require accumulated knowledge and absorptive capacities (Criscuolo and Narula, 2008). During this process, institutional regimes may or may not stimulate craft exporters to innovate products and/or processes.

7.3 RESEARCH METHODS

A configurational comparative analysis tests if the differences between the institutional regimes of the case studies explain variation in innovation of firms, rather than independent or control variables separately (Mollinga and Gondhalekar, 2014). This study compares only three case studies, and therefore faces challenges in relation to validity and robustness, also known as the small N problem. In order to overcome this challenge, it adopts a 'fuzzy-set ideal type' methodology, which allows for 'a precise operationalisation of theoretical concepts, the configuration of concepts into ideal types, and the categorisation of cases' (Kvist, 2007: 474). Ideal types are suitable for configurational comparative analysis, as they describe specific configurations of concepts from the perspective of one or a few points of view (Fiss, 2007; Kvist, 2007: 479; Schneider *et al.*, 2010). This methodology enables theoretical generalisations based on a small number of cases.

I construct ideal types of institutional regimes in emerging economies by combining two perspectives: economic coordination by the state and by firm hierarchies. The combination of these two perspectives leads to four ideal types (see chapter 2):

1. In a *market economy,* economic activities are fully conditioned by market incentives. This is expected to lead to arm's-length innovation systems, capacitated large firms, imitation strategies of firms, and low levels of product and process innovation (Crouch, 2005; Hall and Soskice, 2001).
2. In a *dependent economy*, economic activities are fully conditioned by firm hierarchies. This may arise if local firms depend on orders and knowledge of global buyers, multinationals and/or local corporations. As a result, local firms may absorb knowledge in (quasi-) hierarchical value chains, strategizing process innovations in order to reduce costs (Crouch, 2005; Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009).
3. In a *state economy,* economic activities are conditioned by the rules of the (local) government and intermediary organisations. Local firms are expected to exchange knowledge reciprocally. As the scale of production is likely to be small and sales are mainly local, the scale of production remains

small. Therefore, firms are likely to strategize product innovation (Griffiths and Zammuto, 2005; Whitley, 2000) .

4. In a *joint economy,* economic activities are fully conditioned by the rules of the (local) government, intermediary organisations, local corporations, global buyers and multinationals. This is expected to result in reciprocal knowledge exchange at the local and international level, enabling product and process innovation (Griffiths and Zammuto, 2005).

Each case study may to varying degrees resemble and combine indicators, as introduced in section 3.2, of the four ideal types. Table 7.1 lists indicators which vary between ideal types or determine their strength. Irrelevant indicators are the level of absorptive capacity, observations, knowledge spillover, clustering and knowledge exchange at trade fairs. A factor and ANOVA analysis reveal that the variation of absorptive capacities within case studies is greater than those between. The other indicators do not significantly vary between ideal types either and have, just as absorptive capacity, been used as a control variable instead. The responses on the indicator 'the level of trust in global buyers' are invalid and have been removed.

Some of the indicators in table 7.1 are likely to score similar across ideal types, but express the strength of the ideal type. The presence of strong financial institutions and industrial policies, programmes and regulations, business education and training systems and patenting are essential in export markets, independent of the type of institutional regime.

Table 7.1 Indicators

Indicator name	Abbreviation	Source	Min.	Max.	Main references
BUSINESS SYSTEM					
Transactional dependence on global buyers	Exp. share	Survey	0	100	Crouch, 2005; Lane, 2008;
Industrial policies, programmes, regulations[7]	Ind. policies	Qualitative	0 0	1 1	Schneider, 2009; Whitley,
Strength of financial sector[7]	Fin. sector	Qualitative	0	1	1992, 1999 and
Strength of trade unionism	Unionism	Qualitative	0	1	2000.
Strength of collective bargaining	Coll. bargaining	Qualitative	0	1	
Perceived reliability of formal institutions[7]	Reliable int.	Qualitative	0	1	
Importance of local/national networks[7]	Local netw.	Qualitative	0	1	

INNOVATION SYSTEM					
Perceived importance knowledge of global buyers	Global buyers	Survey	1	5	Asheim and Isaksen, 2002;
Quasi hierarchical global value chain[2]	Quasi-hierarch.	Survey	0	1	Gereffi *et al.*, 2005; Lundvall,
Innovation policies, programme, regulations[7]	Innov. policies	Qualitative	0	1	2007; Lundvall *et al.*, 2002;
Perceived importance knowledge exchange with local/ national non-firm actors[1]	Exchange state	Survey	1	5	Pietrobelli and Rabellotti, 2011
Perceived importance knowledge exchange with local firms	Exchange firms	Survey	1	5	
Strength education&training[7]	Education	Qualitative	0	1	
FIRM STRATEGIES					Damanpour
Outward innovation focus	Outward	Qualitative	0	1	and
Use of own brand in exports	focus	Survey	0	1	Gopalakrishan,
IPR strategy: patenting	Own brand	Survey	0	1	2001; Hall and
	Patenting				Soskice, 2001; Ornaghi, 2006; Whitley, 1992, 1999 and 2000
INNOVATION					
Process[5]	Process	Survey	0	1	Marins, 2008;
Product[6]	Product	Survey	1	4	OECD, 2005
CONTROL VARIABLES					
Firm: employment	Employment	Survey	12	324	Erikson, 2002;
Firm: turn-over (US$ mln.)	Turn-over	Survey	0.195	45	Hall and
Foreign-owned firms	Foreign owned	Survey	0	1	Soskice, 2001; Lane, 2008
Product-market combination[4]	Product-market	Websites	1	3	

[1] The perceived importance of knowledge exchange is measured with the chambers of commerce, business associations, cluster associations, government, universities and finance institutes. This indicator correlates with the question on daily, weekly, quarterly, yearly, or less frequent interactions. [2] A score of 0 is a relational global value chains and 1 is a quasi-hierarchical chain. [4] Ranging from low, to medium and high market segments.
[5] Measured as a dummy for giving priority to various types of process innovations.
[6] Categories are none, new to the firm, new to the territory, new to the sector, new to the world. [7] Measured based on national indicators of the Global Competitiveness Report (Schwab, 2015) and local data from semi-structured interviews.

Table 7.2 Truth table

	Scale	Market economy	State economy[1]	Dependent economy	Joint economy
BUSINESS SYSTEM					
Export share	0-100	----	<=25	>=50	>=50
Ind. policies	0-1	1	1	1	1
Fin. sector	0-1	1	1	1	1
Unionism	0-1	0	1	0	1
Collective bargaining	0-1	0	1	0	1
Reliable inst.	0-1	0	1	0	1
Local networks	0-1	0	1	0	1
INNOVATION SYSTEM					
Global buyers	1-5	<=2	<=2	>=4	>=4
(quasi) hierarchical	0-1	0	0	1	0
Innovation policies	0-1	0	1	0	1
Exchange state/ firms	1-5	<=2	>=4	<=2	>=4
Education	0-1	1	1	1	1
FIRM STRATEGIES					
Outward focus	0-1	0	1	0	1
Use brand	0-1	1	1	0	0.5
Patenting	0-1	1	1	1	1
INNOVATION					
Process[2]	0-1	0	0	1	1
Product[3]	1-4	<=2	>=3	<=2	>=3
CONTROL VARIABLES					
Employment	12-234[5]	>=200	<=50	>=200	50-200
Turn-over (US$ mln)	0.19-45[5]	>=10	<=1	>=10	1-10
Foreign-owned firms	0-1	0	0	1	0.5
Product-market[4]	1-4	2	3	1	3

[1] Assuming a small local market and limited exports. [2] Measured as a dummy to prioritise process innovations. [3] Measured as newness of products to the firm (1), territory (2), sector (3), world (4). [4] Low, medium and high price-quality segments. [5] The lowest and highest aggregate scores of the case studies.

Their relative strengths indicate whether the institutional regime offers firms an enabling environment or not. If not, it may lead to lower levels of innovation than anticipated.

Whether the indicators of each case study reflect an ideal type or not is subsequently determined based on a truth table (table 7.2). The case studies are scored by separately investigating each indicator in comparison with the anticipated outcome of ideal types. Indicators are rescaled on a scale of 0 (fully in)

to 1 (fully out) in order to ease categorisation, noting that one should be careful in interpreting differences between scores of indicators due to different scales of measurement. This results in detailed membership scores of case studies at the level of individual indicators.

Membership scores are subsequently aggregated and calibrated into five categories. A score of 1 is 'fully in'', scores from 0.70 to 0.99 are 'strong', from 0.40-0.69 'moderate', from 0.01-0.39 'weak' and 0 is 'fully out'. The calibration of indicators describes how indicators are rescaled to a scale from 0-1. For instance, the share of exports is expected to be high in a dependent economy. The Global Competitiveness Report (Schwab, 2015) indicates export shares of the three countries under review ranging from 22.4 to 30.7 percent and hence a percentage of 30 can be considered to be high. However, the average export shares of craft exporters in the three territories range from 48 to 83 percent (see annex 3). Therefore, the cut off point between 'strong' and 'fully in' is set at an export dependency of 75 percent instead. The data calibration is detailed in the next section. Case studies are subsequently also compared to each other by comparing mean scores based on ANOVA tests.

The analysis of institutional path dependence and renewal has been operationalised based on qualitative data, collected through semi-structured interviews, observation and secondary data (see section 3.5). The data has been grouped in Atlas-Ti and categorised as described above. However, as the survey does not offer data on the past, only qualitative indicators are applied.

7.4 COMPARING INSTITUTIONAL REGIMES

This section describes and compares the contemporary institutional regimes of the case studies, and subsequently analyses the impact of institutions and their configurations on innovation outcomes.

The research findings show that the case studies share three institutional characteristics, while they differ on others (table 7.3). They share relatively strong industrial policies, programmes and regulations and weak trade unionism and collective bargaining practices. On the one hand, China and Indonesia score above South Africa on the strength of basic institutions at the national level indicators of the Global Competitiveness Report (Schwab, 2015). On the other hand, all three territories prioritise handicrafts in their industrial policies and therefore offer services which are likely to be better than the national aggregate. Furthermore, Cape Craft and Design Institute offers industrial support which is unparalleled in

the other two case studies. I therefore decided to score all three case studies as 'fully in'. However, not all firms equally benefit from the industrial policies. The most notable exception comprises the group of informal firms in Cape Town, which is de-facto excluded from government policies and programmes (see chapter 5).

Weak trade unionism and collective bargaining, as reported in semi-structured interviews and by UNCTAD (2010), potentially weakens state and joint economies, because it indicates that labour representatives are not formally partaking in economic coordination. This institutional environment may in turn condition the collaboration between entrepreneurs and staff in craft firms (Crouch, 2005; Hall and Soskice, 2001; Schneider, 2009).

On all other indicators, the institutions have a greater variety between than within case studies, as can be seen from the two-sided tests of equality (table 7.3). The differences in firm size are glaring: firms in Yiwu are over 7,500 times the size of informal firms in Cape Town and over 150 times the size of firms in Yogyakarta and formal firms in Cape Town.

Before delving deeper into the case studies, table 7.4 first shows the membership scores of each case study by comparing and calibrating the data of table 7.3 to the truth table. The research findings show that the case studies combine elements of all the ideal types (table 7.4). In summary, Yiwu strongly resembles a dependent economy, Yogyakarta moderately resembles a joint economy and Cape Town strongly resembles a segmented state economy. I will now describe each case study, more elaborately detailing the findings represented in tables 7.3 and 7.4.

Table 7.3 Case study description

	Descriptors			Case studies			
	Min.	Max	Mean	Yiwu	Cape Town informal	Cape Town formal	Yogya-karta
BUSINESS SYSTEM							
Export share	0	1	0.66	0.83_a	0_b	0.48_c	0.67_a
Ind. policies[5]	0	1		1^1	0^2	1^2	1^3
Unionism	0	1		0	0	0	0
Coll. bargaining	0	1		0	0	0	0
Fin. sector[5]	0	1		1	0	0.5	0.5
Reliable inst.[5]	0	1		0.75	0	1	0.5
Local networks[5]	0	1		0.5^1	0^2	1^2	1^3
INNOVATION SYSTEM							
Global buyers	1	5	3.8	0.88_a	0.28_b	0.68_b	0.72_a
(Quasi) hierarchical	0	1	0.18	0.20_a	$0.91^4{}_b$	0.01_c	0.15_a
Innov. policies[5]	0	1		0.5^1	0^2	1^2	0.5^3
Exchange state	1	5	1.9	1.9_{ab}	1.0_b	1.8_{ab}	2.2_a
Exchange firms	1	5	2.6	2.9_a	4.1_b	1.6_b	2.6_a
Education[5]	0	1		1	0	1	1
FIRM STRATEGIES							
Outward focus[5]	0	0		0^1	0^2	1^2	1^3
Brand name	0	1	0.58	0.46_a	0.20_{abc}	0.97_b	0.24_b
Patenting	0	1	0.20	0.49_a	0.00_b	0.00_b	0.03_b
INNOVATION							
Product[5]	0	4	2.11	1.53_a	2.18_{ac}	3.13_b	2.06_c
Process[6]	0	1	0.20	0.50_a	0.00_b	0.00_b	0.03_b
CONTROL VARIABLES							
Employment	1	15000	142	324_a	2_b	13_b	37_{ab}
Turnover (1,000 US$)	0.35	1600	17 399	$45{,}427_b$	$6_{a,b}$	227_a	361_a
Foreign owned	0	1	0.15	0.27_a	0.00_b	0.02_b	0.10_b
Product-market[5]	1	3	2.18	1.77_a	$2{,}31_b$	2.67_b	2.33_b
Observations			301	118	11	72	100

Notes: Values in the same row and subtable not sharing the same subscript are significantly different at p<.05 in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction. [1] See section 7.3.1 (Ding, 2012; Mitussis, 2010; Si *et al*., 2015; Wang, 2013). [2] See section 7.3.2 (DTI, 2005; Kaiser Associates, 2009). [3] See section 7.3.3 (Fransen and Tuil, 2017; Indarti, 2010; Ismalina, 2011; Shima ate al., 2006). [4] Suppliers produce for 1 local trader. [5] Measured qualitatively.

Table 7.4 Membership scores (from 0.0 to 1.0)

Variables	Market economy	State economy	Dependent economy	Joint economy
YIWU				
Export share[1]	---	0.0	1.0	1.0
Ind. policies	1.0	1.0	1.0	1.0
Fin. sector	1.0	1.0	1.0	1.0
Unionism	1.0	0.0	1.0	0.0
Coll. bargaining	1.0	0.0	1.0	0.0
Reliable inst.	0.7	0.7	0.7	0.7
Local networks	0.5	0.5	0.5	0.5
Global buyers	0.0	0.0	1.0	1.0
Quasi-hierarchical[1]	0.5	0.5	0.5	0.5
Innov. policies[1]	1.0	0.0	1.0	0.0
Exchange state [1,2]	0.7	0.3	0.7	0.3
Exchange firms[1,2]	0.5	0.5	0.5	0.5
Education	1.0	1.0	1.0	1.0
Outward focus	1.0	0.0	1.0	0.0
Brand name[1]	0.7	0.7	0.3	0.7
Patenting	1.0	1.0	1.0	1.0
Product innovation[1]	1.0	0.0	1.0	0.0
Process innovation[1]	0.0	0.0	1.0	0.0
Employment	1.0	0.0	1.0	0.0
Turnover	1.0	0.0	1.0	0.0
Foreign owned	0.0	0.0	1.0	0.5
Product-market	0.7	0.3	0.7	0.3
Mean score	**0.65**	**0.35**	**0.85**	**0.48**
YOGYAKARTA				
Export share[1]	---	0.0	0.0	1.0
Ind. policies	1.0	1.0	1.0	1.0
Unionism	1.0	0.0	1.0	0.0
Coll. bargaining	1.0	0.0	1.0	0.0
Financial sector	1.0	1.0	1.0	1.0
Reliable inst.	0.5	0.5	0.5	0.5
Local networks	0.0	1.0	0.0	1.0
Global buyers	0.3	0.3	0.7	0.7
Quasi-hierarchical[1]	0.3	0.7	0.3	0.7
Innov. policies[1]	0.5	0.5	0.5	0.5
Exchange state [1,2]	0.0	1.0	0.0	1.0
Exchange firms[1,2]	0.5	0.5	0.5	0.5
Education	1.0	1.0	1.0	1.0
Outward focus	0.0	1.0	0.0	1.0
Brand name [1]	0.3	0.3	0.7	0.7
Patenting	0.0	0.0	0.0	0.0
Product innovation[1]	0.5	0.5	0.5	0.5
Process innovation[1]	0.5	0.5	0.5	0.5
Employment	0.0	0.7	0.0	0.3
Turnover	0.0	1.0	0.0	0.5

Table continued

Variables	Market economy	State economy	Dependent economy	Joint economy
Foreign owned	0.5	0.5	0.5	1.0
Product-market	0.7	0.7	0.3	0.7
Mean score	**0.44**	**0.58**	**0.39**	**0.64**
CAPE TOWN FORMAL				
Export share	---	0.7	0.3	0.3
Ind. policies	1.0	1.0	1.0	1.0
Unionism	1.0	0.0	1.0	0.0
Coll. bargaining	1.0	0.0	1.0	0.0
Fin. Sector	0.5	0.5	0.5	0.5
Reliable inst.	0.5	0.5	0.5	0.5
Local networks	0.0	1.0	0.0	1.0
Global buyers	1.0	1.0	0.0	0.0
Quasi-hierarchical	1.0	1.0	0.0	1.0
Innovat. Policies	0.0	1.0	0.0	1.0
Exchange state	0.5	0.5	0.5	0.5
Exchange firms	0.5	0.5	0.5	0.5
Education	1.0	1.0	1.0	1.0
Outward focus	0.0	1.0	0.0	1.0
Brand name	1.0	1.0	0.0	0.5
Patenting	0.0	0.0	0.0	0.0
Product innovation	0.0	1.0	0.0	1.0
Process innovation	1.0	1.0	0.0	0.0
Employment	0.0	1.0	0.0	0.5
Turnover	0.0	1.0	0.0	0.0
Foreign owned	1.0	1.0	0.0	0.0
Product-market	0.5	1.0	0.0	1.0
Mean score	**0.55**	**0.79**	**0.29**	**0.52**

*Note: s*cores are explained under the subsequent headings.

7.4.1 YIWU

Yiwu's business system strongly resembles that of a dependent economy. The export share of craft firms in Yiwu is significantly higher than that of firms in the the other two case studies, and is exceptionally high compared to China's average of 24.8 percent. This fully represents a dependent economy. By the same token, semi-structured interviews reveal that Yiwu's relatively large craft firms can easily find their way to the financial sector, while their much smaller counterparts in Yogyakarta and Yiwu report that they face difficulties in relation to collaterals and letters of credit. 46 percent of the firms borrow money from financial institutions, which is comparable to Yogyakarta and significantly higher than Cape Town (annex 3). It is calibrated as 'fully in' all ideal types. The reliability of formal

institutions and a moderate level of local and national networks have extensively been discussed in chapter 6. Their scores remain the same.

The innovation system strongly resembles that of a dependent economy. The entrepreneurs attach significantly more importance to knowledge of global buyers than do their counterparts of the other two case studies. Table 7.3 therefore shows that knowledge exchange with global buyers fully represents a dependent economy. Its weak innovation policies, programmes and regulations, as described in chapter 6, fully resemble a dependent economy as well. Fu and Gong (2011) note that China's ambitious innovation policies do not focus on low-tech SMEs, which is confirmed for the case study by respondent #129. Furthermore, 20 percent of all firms operate in (quasi) hierarchical global value chains, a score which is inconclusive and therefore scores moderate on all institutional regimes. Knowledge exchange with other firms also scores average and is calibrated as moderate as well, while knowledge exchange with the state – as shown in table 7.3 and discussed in chapter 6 – strongly resembles a dependent economy.

Firms' strategies, innovation levels and control variables strongly resemble those of a dependent economy. The inward-looking strategies of craft exporters, relatively large use of patenting, large firm-sizes, innovation levels and relatively large number of foreign-owned firms fully resemble a dependent economy (see chapter 6). The low to medium score for product-market segment (table 7.3) strongly resembles a dependent economy and the use of own brand name by 46 percent of the firms only weakly resembles a dependent economy.

7.4.2 YOGYAKARTA

By contrast, Yogyakarta's economy strongly resembles that of a joint economy. The relatively modest export share (67 percent; see table 7.3) is fully in line with that of a joint economy. The strong local networks, as indicated by the close ties of trust within Jakarta's clustered small firms, fully resemble that of a joint economy as well (Brata, 2009 and 2011; Ismalina, 2011; Indarti, 2011; Tambunan, 2006). The reliability of formal institutions scores moderate, which reduces the impact of government and intermediate actors on craft firms. This is in line with Indonesia's scores of the Global Competitiveness Report (Schwab, 2015) and relates to the research findings. On the one hand, government offers extensive support to crafters in Yogyakarta (chapter 4; Fransen and van Tuyl, 2017) and on the other hand the local government is perceived to be bureaucratic and inefficient, and its it is seen to collude with those of business associations (respondents #2, 3, 6 10, 11, 13, 14, 16, 25, 32; Indarti, 2010; Shima *et al.*, 2006).

The innovation system strongly resembles that of a joint economy. Table 7.3 shows that firms strongly value knowledge from global buyers (but not as much as firms in Yiwu do) and attach more value to knowledge from government than do their counterparts. The last is scored as fully resembling a joint economy. This combination enables firms to combine global and local knowledge, as analysed in chapter 4. The 15 percent share of firms operating in quasi hierarchical global value chains is lower than that in Yiwu and informal Cape Town but higher than formal Cape Town; it is therefore scored as weakly resembling a joint economy. Finally, the innovation policies are, as described in chapter 4, moderate. It focuses on clustered subcontractors, without supporting the more innovative traders.

Firm strategies and characteristics moderately resemble those of a joint economy. Its moderate number of foreign-owned firms and the outward-looking strategies of firms, indicated by priority given to product innovation in the survey, fully resemble a joint economy. The relatively limited use of brand names and the medium product price segment within which firms operate strongly resemble a joint economy (table 7.3). However, the relatively small firm sizes and limited amount of patenting only weakly resembles a joint economy (table 7.3).

7.4.3 Cape Town

Cape Town's economy strongly resembles a state economy across the business system, innovation system, firm strategies and control variables. Its main features are a relatively low coordinating role of international actors due to a low export share and relational global value chains, strong local support and strong local networking among small firms specialised in product innovations and non-firm actors.

Formal firms in Cape Town fully resemble a state economy based on the following scores in table 7.3: they score significantly the lowest on the importance attached to knowledge of global buyers, operating in (quasi) hierarchical global value chains, process innovation, firm size and foreign firm ownership. They score highest on the use of their own brand name, product innovation and the price market segment.

On other factors, Cape Town moderately to strongly resembles a state economy. Formal firms export 48 percent and informal firms only export indirectly, which percentages are significantly lower than those of the other two case studies, strongly indicating a state economy (table 7.3). The World Competitiveness Report furthermore scores the reliability of South Africa's formal institutions lower than those in Indonesia and China, but this is partially rectified by the strong

coordinating role of Cape Craft and Design Institute (see chapter 5). Segmentation, however, indicates that formal institutes can be perceived as being unreliable in regard to informal firms (see chapter 5). Its score is therefore 'moderate'.

Respondents score the role of the state and firms in national and local knowledge exchange as moderate (table 7.3). However, qualitative data reveals strong local networks among craft firms, whereby formal firms meet regularly, operate in clusters around shopping malls and the creative business district 'The Fringe', and subcontract to informal firms (see chapter 5). Nevertheless, the amount of evidence is insufficient to change the survey's score in table 7.4.

7.4.4 INNOVATION OUTCOMES

The previous sections have described differences in institutional regimes between the case studies. This section reveals that differences in institutional regimes to a significant degree explain the variety in product and process innovation among firms as well (table 7.5). The regression analyses show that the impact of institutional regimes is highly significant (table 7.5). Its relatively strong explanatory power can be seen from the rather high pseudo R^2. Various other factors influence the innovation of firms as well. The odds of product innovation increase when firms operate in relational global value chains, while the odds of process innovation increase when firms are subsidiaries. Firm competences increase the odds of both product and process innovation.

A Chow test assesses if the regression models of the three case studies differ significantly. This illustrates differences in institutional regimes affecting innovation and reduces the risk of endogeneity. The Chow test shows of the regressions on product and process innovation differ at 0.01 significance (resp. $F=45.83 > F(4, 267)=3.51$ and $F=32,40 > F(4,278)=3,51$). As shown in chapter 4 to 6, the variables affecting innovation and their coefficients differ between case studies.

Table 7.5 Regression results

	Product innovation[1]	Process innovation[2]
Institutional regime		
Yogyakarta	1.348*** (0.298)	-3.782*** (0.701)
Cape Town formal	3.020*** (0.363)	-21.352 (4 800)
Cape Town informal	3.425*** (0.740)	-20.434 (11 765)
Individual institutions		
Quasi-hierarchical value chain	-1.243* (0.452)	
External ownership		0.979* (0.478)
Balanced competences	1.095** (0.322)	1.571* (0.658)
Education	0.920** (0.267)	
Borrow money		0.893* (0.422)
Observations	267	278
Pseudo R^2 (Nagelkerke)	0.436	0.537

Notes: Standard errors in parentheses * $p < 0.10$, ** $p < 0.01$, *** $p < 0.001$
[1] Ordered probit regression;[2] Binary logistic regression

7.4.5 CONCLUSIONS

This section has shown that the institutional regimes differ significantly between the three case studies, and that these differences explain variation in innovation among firms. International, national and local institutions and actors align within unique institutional regimes. They do not take the form of an ideal type, but instead combine elements of all typologies. Variety in innovation is explained by these configurations and by differences in firm competences, global value chains and firm ownership.

7.5 INSTITUTIONAL PATH DEPENDENCE AND RENEWAL

7.5.1 MAPPING EVOLUTIONS

The growth and diversification of the international trade in handicrafts has enabled Yiwu, Yogyakarta and Cape Town to specialise in handicrafts. Their institutional environment and arrangement incentivise product and/or process innovations. This section traces their history and the next sections subsequently analyse path dependence and renewal.

The section first offers an overview of the evolutionary patterns over the past four decades, based on the analysis of the remainder of section 7.5 (table 7.6). Until the 1980s, craft exports were still rare in emerging economies. The research findings show that the sector mainly comprised informal firms producing small quantities of traditional crafts for local markets. All case studies have subsequently witnessed path renewal between 1982 and 1994. In this period, communism ended in Yiwu, apartheid and international isolation ended in Cape Town, and export markets opened up in Yogyakarta. Global value chains transformed from (quasi-) hierarchical to relational around this period as well (Gereffi, 2014). Yiwu's economy transformed a second time when exports surged around the year 2000. Arguably, the institutional heterogeneity is once again on the increase in all case studies: the surge towards innovation policies appears to increase the role of government and intermediary organisations, local sophisticated demand in emerging economies has increased due to economic growth, and demand in developed economies has reduced due to the financial crisis. As a result, local value chains may increase in importance (Gerrefi, 2014). This trend may however be countered by the slowing down of economic growth rates in emerging economies.

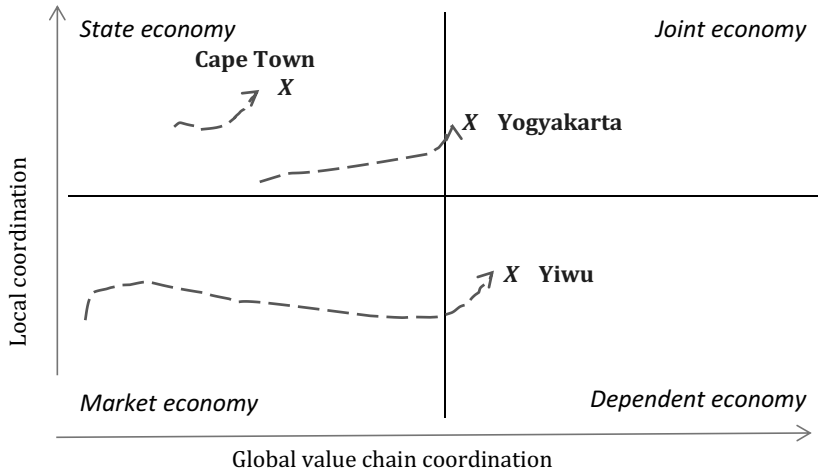
Figure 7.1 graphically visualises the evolution of the institutional regimes within the three case studies. The closer a case study is located to the centre of the figure, the more characteristics of the ideal types are combined. The dotted lines estimate the development trajectory based on limited data and should be treated with care. The main trends are as follows. Craft firms in Cape Town started off as an isolated, closed and segmented *state economy*. Over time the role of global buyers somewhat increased and the economy opened up, but the economy still strongly resembles a segmented *state economy*. Yogyakarta started off moderately resembling a *state/localised market economy*, whereby small, informal firms strongly networked within traditional clusters and sold traditional Javanese art locally. When export markets opened up, the role of global buyers increased significantly and the economy transformed: firms now operate in relational global value chains and exchange knowledge locally with government, intermediary organisations and firms. By contrast, Yiwu started off as a *market economy*, with weak government support and value chain coordination. The government increasingly regulated and supported the market economy. When exports opened up, Yiwu moved towards a dependent economy: its economy is increasingly influenced by global buyers and multinationals.

The table also shows a transition towards stronger economic coordination (right and up in figure 7.1). Indeed, the next sections illustrate that economic coordination has strengthened over time, but trade unionism and collective bargaining have remained behind.

Table 7.6 Institutional regimes over time

	1980	1990	2000	2010
Yiwu	Pre-phase	Local market economy	Dependent economy	Growing heterogeneity?
Yogyakarta	Pre-phase	Joint economy	Growing heterogeneity?	
South Africa	Pre-phase	Segmented state economy	Growing heterogeneity?	

Figure 7.1 Evolving institutional regimes of craft exports



I now map the evolution of handicraft exports in each case study, before analysing path dependence and path renewal. The mapping gives more substance to the brief evolutionary process. Table 7.7 summarises the indicators, whereby those of the contemporary institutional regimes have been taken from table 7.4. Yiwu's evolution has already been described in chapter 6.

Yogyakarta

Until 1990, Yogyakarta's institutional regime moderately resembled a state and localised market economy. On the one hand, handicrafts in Yogyakarta functioned

primarily as an informal industry, largely ignored by the state. Dr Habibie, Minister of Research and Technology during the Soeharto period, aimed at modernizing industry in Indonesia. He installed an elaborate support system for large firms in monopolized high-technology sectors. Especially during the oil boom (1974-1981), the government adopted an interventionist approach that benefited state-led industries. At the same time, industrial policies, programmes and regulations and financial institutes ignored SMEs and restricted export opportunities (Wengel and Rodriques, 2006; Wie, 2006). The indicators 'industrial policies, regulations and programmes', 'strength of the financial sector' and 'reliability of formal institutions' of table 7.7 therefore score fully out of a state economy; they instead fully resemble a market economy.

On the other hand, strong local networks among firms and business associations fully and limited exports strongly resemble a state economy. During this period, craft firms were clustered in villages, which were specialized in one product. Firms used locally available raw materials and skilled labour, and mainly produced for local markets, (Fransen and Tuil, 2017; Ismalinda 2011). There were about ten craft clusters in and around Yogyakarta. Industrial structures were socially embedded, but not very dynamic and often poverty-driven. The level of innovation was very low. Two clusters were found to be more dynamic: silver, due to demand and knowledge of the Dutch occupiers, and leather, due to exports (Isminalda, 2011). These clusters still exist, though they are now in part included at the bottom of global value chains, and transformed into tourist and trading centres (Tambinan, 2006; observations during field work).

The innovation system moderately resembled a state economy as well. It fully resembles a state economy with respect to the limited knowledge exchange with global buyers in combination with strong knowledge exchange within clusters (Ismalina, 2011; Brata, 2009 and 2011). Of particular importance is that the education and training system improved sharply during this period of time and started to strongly resemble a state economy (Wengen *et al.*, 2006; Wie, 2006). On the other hand, the weak role of the state in knowledge exchange and the weak innovation policies in support of crafters, linked to the governments' high-technology focus, is fully out of line with the notion of a state economy; instead it resembles a market economy (Ismalina, 2011; Brata, 2009 and 2011; respondent # 11, 15).

The strategies and characteristics of the crafters strongly resembled those of a state economy. Firms operated on a small scale, were locally owned and were outward-looking in order to sell crafts in their own brand name in local markets. Their level of product and process innovation, however, was relatively low, as they mainly sold traditional designs and used traditional production methods

(respondents #1, 8, 9, 11, 15 and 30). This may reflect the weak coordinating role of the government in craft exports.

The Soeharto period laid the basis for the second stage as basic education improved sharply, domestic markets grew by about 7% annually and firms' competences slowly improved. In 1983, the end of the oil boom reduced export earnings, leading to financial constraints. Hereafter, the interventionist approach became too expensive to maintain and policies gradually shifted towards export promotion. Exports were also triggered by the depreciation of the Rupiah in 1989. As a result, it became lucrative for small firms to export, based on local material and low labour costs. By contrast, exports of large firms, which had lost their subsidies and support, dropped by 10% (Wengen *et al.,* 2006). Overall, the period from 1983 to 2002 witnessed an explosive growth of export of 27% a year and a radical economic transformation (Wie, 2006).

The second stage started around 1990, when handicraft exports boomed. *Out of Asia* relocated from Bali to Yogyakarta in order to benefit from the raw materials and low salary levels, about 1/3rd of the salaries in Bali. *Out of Asia* was led by an Australian designer, well acquainted with western markets. Being the first highly educated entrepreneur to enter the sector in Yogyakarta and being the first trading company that targeted the global market of handicrafts, it had an immense impact on the sector (respondent #5, #11, #37, #53). Products became contemporary, materials were mixed, poverty-driven clusters were included in global value chains and global buyers became main sources of knowledge on international markets, designs and technologies. As firms gained competences and global value chains became of increasing importance, the economy transformed from a state to a joint economy.

According to respondent #5, who worked at Out of Asia at the time, the standard profit margin at that point was 42%. Many highly educated entrepreneurs entered the rapidly growing sector lured by seemingly endless export potential and the high profit margins. Some started their career at *Out of Asia* (8%), which is why the sector refers to *Out of Asia* as 'the university of craft'. Firms that entered more specialized market niches noted margins of 50% up to 100% (resp. #5, 11, 53). Exporters experimented with captive value chains (resp. #6, 10, 12), with low-, medium- and high-cost market segments and with different levels of subcontracting. As noted by respondent #37:

> I joined *Out of Asia* in 1998. There were not many trading companies at the time. After 2000, many companies started small and became big. (..) We called the new firms '*Out of Asia* Alumni'.

Since 2002, a range of external shocks led to a greater role of the state and intermediary organisations. These shocks included the Bali bombing in 2002, an earthquake in 2006 and the global financial and economic crisis from 2008 till now. The Bali bombing about halved demand from tourists, but had a limited impact on exports. The earthquake destroyed stock and factories, which created financial constraints and seriously threatened the firms' potential to deliver. Respondent #10, for instance, lost his factory due to the financial crisis and subsequently lost his clients because he could no longer fill orders. The government, NGOs and Development Aid came to the rescue, enabling exporters to attend international trade fairs and firms that were destroyed to be reconstructed. Cluster associations mediated the support of government and donor agencies. The financial crisis subsequently about halved exports to the USA and Europe. This was partly compensated by increased demand in emerging economies, including Indonesia itself, but how to survive still became the main issue for many firms (respondent #1, 9 and 33).

Cape Town

Craft exporters in Cape Town have been affected by major policy reforms over the past four decades, such as the end of apartheid, new policies and programmes to support craft firms, and the opening up of exports after decades of international boycotts. Nevertheless, it has hardly changed its institutional regime: it started off as a state business system, strongly segmented between formal and informal firms, and it still is. Exports have not taken off on a large scale either.

Until 1994, craft exports in Cape Town were seriously constrained by apartheid for two reasons. First of all, an international boycott restrained export opportunities and tourism (DACTS, 1998; DTI, 2005). This has resulted in a business system with a very low export share and an innovation system with weak international linkages, fully resembling typical state economies. Second, apartheid and colonialism have deeply instilled segmentation within the business system (Gradín Lago, 2013; Wilson, 2011). During colonialism and apartheid, the social base of government was narrow, as it mainly served the white population. The white population benefited from excellent infrastructure and services, while the black population was excluded. As people identify with their specific local environment, spatial segmentation reinforces racial and economic segmentation (Cornelissen and Horstmeier, 2002). The formal sector was mainly run by white entrepreneurs from the inner city and high-income areas. They benefited from a reliable government, first-world industrial policies, programmes and regulations, an excellent financial system, policies in support of creative design, strong local clustering, strong exchange of knowledge and excellent education (DTI, 2005; Kruss, 2006; Wesgro, 2005). Formal firms developed their own designs, isolated

from global markets but inspired by international art and design (DTI, 2005). By contrast, the informal sector was very small and isolated. Black South Africans faced impenetrable barriers in setting up and running formal firms. The barriers were created by laws, local by-laws and segmented social networks (Cornelissen and Horstmeier, 2002; Iheduru, 2004; Wilson, 2011). Even towards the end of apartheid, the Business Act 71 of 1991 effectively banned informal traders from the inner city and shopping areas (Kruss *et al.*, 2010; Wesgro, 2000). At the same time, well-intended support of crafts by NGOs did not help to prepare crafters for competitive global markets. As a result, the following indicators are scored as moderate: industrial policies, financial sector, reliable formal institutions, innovation policies and knowledge exchange. The education and training system is scored as strongly resembling a state economy, because Cape Town has excellent public educational facilities (Kruss *et al*., 2010).

Firm strategies and characteristics strongly resembled a state economy. Formal firms were small, locally owned and outward-looking in order to sell creative crafts in local medium to high-price market segments. However, contrary to a typical state economy, firms did not protect designs through patenting at all (respondent #83 and 84).

Since the end of apartheid, policies have changed drastically. They have aimed at increasing exports and softening racial segmentation. South Africa has been acknowledged as leading in local economic development. Municipalities were given a developmental role for pro-poor growth (Nel *et al*., 2009; Rogerson, 2003 and 2010), small and medium-sized firms have been supported (Herrington *et al*., 2010) and black entrepreneurship and employment were promoted through Black Economic Empowerment initiatives (Iheduru, 2004). The government set up formal policies and programmes in support of the craft sector in 1991, whereby Cape Town became one of the three handicraft hubs in South Africa. In 1991, the National Craft Council was established as well, albeit heavily criticised as being ineffective, and in 1993 the first ever national craft exhibition was held in Johannesburg (DTI, 2005). After apartheid ended, crafts became a priority sector, whereby social and economic objectives have been blended (DTI, 2005; DACST, 1998). In the same period, the policy environment for SMEs improved and tourism grew rapidly. Support received an impulse when the Creative Industries Sector Desk was established within the Department of Trade and Industry in 2001 and once again when the craft sector was identified as one of the 11 priority sectors of the creative industry in 2005. The craft sector development strategy takes an integrated approach, offering support in business development and R&D, and creating an enabling environment (DTI, 2005; Kaiser Associates, 2009). In Cape Town, furthermore, the institutional arrangement was adjusted in order to

Table 7.7 Evolving institutional regimes

	Yiwu			Yogyakarta		Cape Town (formal)	
	Phase 1: Pre-phase[1]	Phase 2: Local market economy[1]	Phase 3: Dependent economy[2]	Phase 1: State economy[3]	Phase 2: Joint economy[2]	Phase 1: Segmented state economy[4]	Phase 2: Segmented state economy[2]
BUSINESS SYSTEM							
Export share	0.0	0.0	1.0	0.7	1.0	1.0	0.7
Ind. policies	0.0	0.5	1.0	0.0	1.0	0.5	1.0
Unionism	0.0	1.0	1.0	0.0	0.0	0.0	0.0
Coll. bargaining	0.0	1.0	1.0	0.0	0.0	0.0	0.0
Fin. sector	0.0	0.5	1.0	0.0	1.0	0.5	0.5
Reliable inst.	0.0	0.5	0.7	0.0	0.5	0.5	0.5
Local networks	--	0.5	0.5	1.0	1.0	1.0	1.0
INNOVATION SYSTEMS							
Global buyers	0.0	1.0	1.0	1.0	0.7	1.0	1.0
Quasi-hierarch.	0.0	1.0	0.5	1.0	0.7	1.0	1.0
Innov. policies	0.0	1.0	1.0	0.0	0.5	0.5	1.0
Exchange state	0.0	0.7	0.7	0.0	1.0	0.5	0.5
Exchange firms	--	0.5	0.5	1.0	0.5	0.5	0.5
Education	0.5	0.7	1.0	0.5	1.0	0.7	1.0
FIRM STRATEGIES							
Outward focus	0.0	0.0	1.0	1.0	1.0	1.0	1.0
Own brand	--	1.0	0.3	1.0	0.7	1.0	1.0
IPR strategy	0.0	0.0	1.0	0.0	0.0	0.0	0.0
INNOVATION							
Product	0.0	0.5	1.0	0.3	0.5	0.7	1.0
Process	0.0	0.5	1.0	0.7	0.5	1.0	1.0
CONTROL VARIABLES							
Firm size	--	0.5	1.0	1.0	0.4	1.0	1.0
Foreign owned	0.0	1.0	1.0	1.0	1.0	1.0	1.0
Product-market	1.0	0.0	0.7	0.5	0.7	1.0	1.0
Mean score	**0.08**	**0.59**	**0.85**	**0.51**	**0.64**	**0.69**	**0.79**

[1] See section 7.5.1 (Forste, 2010; Ding, 2007; GuaHua, 2000; Mitussis, 2010; Si, 2014; Wang, 2013; Wang and Lin (2013); Respondents #1, 31, 100, 102, 104, 105, 107, 108, 122, 125, 128, 129, 130, 131). [2] Indicators are drawn from table 7.4. [3] See session 7.5.2 (Fransen and van Tuil, 2017; Ismalina, 2011; Tambunan, 2006; Wengen *et al.*, 2006; Wie, 2006; Respondents #1, 5, 6, 9, 10, 11, 12, 33, 37, 53). [4] See section 7.5.3 (Adato *et al.*, 2006; Cornelissen and Horstmeier, 2002; DACST, 1998; Devey *et al.*, 2006; DTI, 2005; Gradĩn Lago, 2013; Herington *et al.*, 2010; Iheduru, 2004; Kaiser Associates, 2009; Kruss, 2006; Kruss *et al.*, 2010; Nel *et al.*, 2009; Padayachee, 2013; Rogerson, 2003 and 2010; Wilson, 2011).

implement the policies and programmes. CCDI emerged, alongside other intermediary organisations and government programmes.

The impact of these policies, programmes and arrangements is widely questioned (Devey *et al*., 2006; Iheduri, 2004; Nel *et al*., 2009; Padayachee, 2013; Rogerson, 2000 and 2003). Racial segmentation is still mirrored in the spatial structure of Cape Town (Pieterse, 2010), racially structured social networks (Adato *et al*., 2006), skewed access to and persistent differences in the quality of education (Kruss *et al*., 2010), and the dysfunctional labour market (Gradín Lago, 2013). In handicrafts, racial segmentation is still reflected in the division between formal and informal firms. Exports are still relatively small. Core arguments are that the effect of policies is watered down by a joint and at times conflicting focus on growth and redistribution, and that the government response to the challenge of segmentation was weak and late in coming (Nel, Binns and Back 2009, Rogerson 2003). The slow change of informal institutions has undoubtedly contributed to the limited impact.

Over the past few years, support from government and intermediary organisations has focused on product innovation and design. Cape Town became Design Capital 2014 and a new and ambitious business district "The Fringe" is heavily supported and branded as a design district. At the same time, CCDI has been successful in enabling a few black entrepreneurs to formalise. Some of these black entrepreneurs started off as informal firms, and have formalised over time. Other firms have been set up by educated designers and artists. Black entrepreneurs innovate slightly differently, as they network more strongly within global value chains. By contrast, the informal sector has not changed significantly.

7.5.2 Analysing institutional path dependence

This section finds anecdotal evidence of institutional path dependence in the case studies. In line with the study's indicators, it discusses the irreversibility of initial institutions, the self-reinforcing ability of institutional regimes, sunk costs and reinforcing recent events.

The irreversibility of initial institutions

Study results indicate that some informal institutions, which were formed long ago, have an irreversible and self-reinforcing effect on institutional regimes, as argued by Martin (2012), Rafiqui (2009) and Williamson (2002). Informal, initial institutions shape and reshape the institutional regimes, limiting the possible directions that path renewal may take. The study results indicate that especially

ties of trust and entrepreneurship may endure over sustained periods of time, steering development trajectories in path-dependent patterns:

- In Yiwu, the study results presented in section 6.4.4 illustrate that weak ties of trust among local actors and high levels of entrepreneurship in low product-market segments have been in existence among Yiwu's family firms over centuries. They have been traced back to the age-old tradition of bartering of brown suger (GaoHua, 2000; Si *et al.*, 2015; Qi, 2000), and are still as relevant as ever (see section 6.4.4). Other scholars also note the entreneurship of and limited trust between Chinese family firms (Mitussis, 2010; Wang, 2013; Whitley, 1992; Witt and Redding, 2013; Yueh, 2013).

- In Cape Town, decades of apartheid and colonialism have arguably resulted in the formation of a segmented institutional regime. During that period, the government mainly served the white population, while black South Africans faced virtually impenetrable barriers in setting up and running formal firms, created through laws and segmented social and physical networks (Cornelissen and Horstmeier, 2002; Gradín Lago, 2013; Iheduru, 2004; Wilson, 2011). Towards the end of apartheid, the Business Act (No. 71 of 1991) effectively banned informal traders from inner city and shopping areas (Wesgro, 2000). These roots of segmentation – as initial path events – are still in evidence today. The study findings show that Cape Town's contemporary institutional regime is still segmented and that segmentation strongly correlates with the race of the entrepreneur (see chapter 5). Segmentation is likely to be reinforced by the segmented spatial structure of Cape Town (Pieterse, 2010), racially structured social networks (Adato et al., 2006), skewed access to education, persistent differences in the quality of education (Kruss et al., 2010), and a dysfunctional labour market (Gradín Lago, 2013). As people identify with their specific local environment, spatial segmentation may continuously reinforce racial segmentation (Cornelissen and Horstmeier, 2002).

- In Yogyakarta, the clustering of craft firms in and around Yogyakarta dates back over centuries and the entrepreneurs still tend to live and work in the same clusters as their forefathers. They share knowledge on products and markets, but not often on prices. Social networks have been institutionalised in religion, networks of informal support and cluster associations (Brata, 2009 and 2011; Ismalina, 2011; Shuma *et al*., 2006). These ties of trust are still exceptionally strong and knowledge exchange within clusters scores significantly higher than that outside or between clusters. Traders, such as respondent #7, indicate that they foremost feel

responsible for their subcontractors within the cluster. When a firm receives an exceptionally large order, it will call upon other firms within the community for assistance (respondents #1 and 9).

Self-reinforcing institutional regimes

The institutional regimes of the case studies show a remarkable ability to adjust to market volatility, shocks and radical policy changes. Most of the time the institutional regime changes incrementally even when formal institutions change or when a shock hits the industry:

- Cape Town has undergone radical policy reforms following the end of Apartheid. At the same time, actors have changed their roles and new actors have emerged. CCDI, as one of these new actors, supports starting entrepreneurs by offering targeted business development support, an R&D centre, networking support, coaching and any other support deemed necessary. This has enabled a small group of black entrepreneurs to join the formal sector. The segmented state economy has nevertheless prevailed, most likely due to the already mentioned rigidity of informal institutions, late and ambiguous policies (Nel *et al.*, 2009; Padayachee, 2013) and the limited support given to survival entrepreneurs (see also Devey *et al.*, 2006). The institutions offer mixed, ambiguous signals to craft exporters, ranging from the policy signal that informal firms should be included in the formal economy to the de-facto exclusion of informal craft firms in industrial programmes. These mixed institutional incentives arguably allow actors to ignore and/or reinterpret formal rules in line with self-reinforcing informal institutions (Hall and Thelen, 2009).

- Yiwu's craft exporters experience incremental change of the institutional regime as well. I illustrate this for the localised market economy of the period 1980 – 2000. In China, the introduction of new laws, policies and infrastructure in support of a market economy has been phased over a sustained period of time (Yueh, 2013). This is also true in Yiwu, which has been a forerunner. Policies, regulations, programmes and (physical and social) infrastructure have been slowly but constantly developed (GaoHua, 2000). As detailed in chapter 6, this gradual change in formal institutions and infrastructure has enabled local craft firms to gain experience and competences. The combination of the initial informal institutions (low levels of trust, high level of entrepreneurship in low product price segments) and the formation of formal institutions in favour of a market economy arguably led to the emergence of low tech industry and trade in Yiwu.

- The ability of an institutional regime to withstand shocks is also indicated by Yogyakarta's case study. Yogyakarta has been hit by an earthquake in 2006 and financial crises from 2008 onwards. The earthquake has destroyed factories and their stock. The subsequent financial crisis reduced export earnings. The actors changed their behaviour in order to deal with the crises, using their social ties within clusters. Before the earthquake, for instance, social ties within clusters were strong, but cluster associations were considered to be ineffective and redundant (Fransen and Tuil, 2017). However, cluster associations started mediating between government, donor agencies and communities in the reconstruction process following the earthquake. This strengthened cluster associations and created stronger ties of trust between the government, civil society and firms. Strengthened local institutions and actors have arguably enabled the sector to respond flexibly to the financial crisis (Fransen and Tuil, 2017) and contributed to the innovativeness of craft firms (see chapter 4). The initial informal institutions (social ties within clusters) in combination with the coherence of the institutional regime have arguably enabled crafters to overcome the shocks and have resulted in incremental change (stronger cluster associations, stronger ties of trust between clusters and the government, higher levels of innovation).

Reinforcing effect of innovations

Innovation outcomes are likely to reinforce institutional regimes due to the strategic coupling between global buyers and business systems (Henderson, 2004) and the creation of financial reserves. These reinforcing effects cannot be proven, but can be illustrated theoretically.

The case studies are likely to have distinctly different strategic couples:

- Informal firms in Cape Town have low innovation levels and are seen to couple with local buyers interested in low cost production.
- Formal firms in Cape Town have high levels of product innovation and couple with global buyers interested in innovative products.
- Craft exporters in Yiwu with high levels of process innovation couple with global buyers looking for low-cost mass production.
- Craft exporters in Yogyakarta have medium levels of product and process innovation and couple with global buyers interested in medium product-market segments.

Strategic coupling is likely to have a self-reinforcing effect: global buyers are more likely to visit Yiwu when they strategise low -, Yogyakarta when they strategise medium - and Cape Town when they strategise high product-market segments.

Innovation is also likely to feedback to firm strategies. The first feedback loop is that innovative firms are likely to have dynamic and durable routines. If innovations prove to be successful, the routines are reinforced (Nelson and Winter, 1982). The second is that innovations create financial reserves which can be reinvested in innovations.

Enforcing effects of recent events

The study finds that recent events may reinforce an institutional regime, as is the case for quasi-hierarchical global value chains in Cape Town which reinforce segmentation (see chapter 5), or they may conflict with the institutional regime causing ambiguity and heterogeneity. The latter is discussed in the subsequent section, which illustrates that recent events may also cause path renewal. The enforcing effect of recent events is therefore not always valid.

Sunk costs

The handicraft sector has sunk costs vested in physical assets, such as buildings and machinery, natural assets, such as mines and forests, people, organisations and knowledge networks. Sunk costs are likely to create a certain 'hardness' to path dependence (Geels and Schot, 2007), as can be illustrated by a number of examples: many craft exporters continue selling handicrafts despite low prices and (temporary) losses during the financial crisis. Due to their sunk costs and accumulated knowledge, it is not easy to switch to another sectors; CCDI in Cape Town applies for new subsidies in order to sustain itself, illustrating that sunk costs result in vested interests; and craft exporters in Yiwu stick to the production and sales of handicrafts despite reducing profit margins. However, the sunk costs in handicrafts are likely to be low compared to those in high-tech sectors and their effect may therefore be limited. Unfortunately its relative importance can not be assessed.

7.5.3 Analysing path renewal

The above section has presented anecdotal evidence of institutional path dependence. However, the evolutionary map shows that all case studies have renewed themselves in the 1980s/90s, when the market and global value chains of handicrafts altered and the case studies enforced policy reforms. Yiwu altered its

development path once again around the year 2000, when exports brought in new institutional regimes. Path renewal is indicated by growing heterogeneity within institutional regimes and a radical change in the level of product and process innovation (see section 7.5.1).

Table 7.8 identifies the main causes of path renewal based on evolutionary descriptions of the case studies. It appears that policy reform and the entrance of firms into new markets have most often triggered path renewal. Policy reforms include new industrial policies (Yiwu, Yogyakarta), the opening up of export opportunities (Yogyakarta) and education and training policies (Yiwu; Yogyakarta). More recently, the introduction of innovation policies (in all case studies) has resulted in a growing heterogeneity of institutional regimes. New market opportunities include the opening up of export opportunities and a growing market for sophisticated local demand (in all cases). Half of all path renewals are caused or strengthened by the introduction of new craft exporters, who bring new competences, strategies and innovations. Two transformations can be attributed to the agency of existing firms. In Yogyakarta, *Out of Asia* greatly impacted on the sector and in Cape Town, the agency of opportunity-driven black entrepreneurs enabled them to enter the formal sector. The agency of non-firm actors has contributed to a growing heterogeneity within the institutional regimes, but has not (yet) led to configurational change: the China Yiwu Design Centre facilitates the entrance of designers in Yiwu and the Cape Craft and Design Institute facilitates the entrance of black entrepreneurs into the formal sector. Finally, changes in relative prices and shocks – including the financial crisis, an earthquake and a bombing – also affect the incentive schemes and competences of firms to innovate, but have not clearly led to path renewal.

The findings show that path renewal is not caused by one particular factor, but by a growing heterogeneity within the institutional regime and shocks. Heterogeneity seeps into business and innovation systems, because informal institutions change very slowly, formal institutions change a bit faster and actors have agency. The direction of change is likely to be influenced by initial informal institutions, which limit possible development trajectories. This can be illustrated by analysing path renewal in Yiwu around the year 2000. At that time, the business system changed from a localised market economy to a dependent export-oriented economy due to three closely intertwined factors. The first factor is that Chinese craft firms were enabled to serve export markets due to their improved competences. Two decades of educational and industrial policies had enabled firms to build up competences, experiences and resources in local markets. Second, the global buyers that entered the Chinese scene did not want suppliers to design products, causing a potential conflict between prior strategies of Chinese suppliers and strategies of global buyers. Most local firms subsequently decided to fire their designers, resulting in

the emergence of a dependent, export-oriented economy. The question is why Chinese firms were willing to downgrade. This is likely to relate to the third factor: Chinese family firms are likely to have welcomed industrial downgrading, because it reduced risks in line with their entrepreneurship in low product-market segments and the limited local risk sharing due to weak ties of trust.

Table 7.8 Main triggers of path renewal

	1980s and 90s	2000	2010
Yiwu	To a market economy • Industrial policies • New firms	To a dependent economy • Export markets • Global value chains	Growing heterogeneity • Innovation policies • Sophisticated markets • Agency of design centre and firms • Global market changes
Yogyakarta	To a joint market economy • Export orientation • New firm and agency of firms • New markets		Growing heterogeneity: • New (local) markets • Shocks • Global market changes
South Africa	To a segmented state economy • Policies ending apartheid • Sophisticated export markets • New firms		Growing heterogeneity: • Agency of non-firm actor: CCDI • Innovation policies and the Fringe • Formal black firms

7.5.4 CONCLUSION

This section has illustrated that the present institutional regimes and innovation outcomes can be understood based on their history. The study findings are to be treated with care due to the small number of case studies and limited data availability. Dosi and Teece (2005) note that institutional regimes are predictable in the medium term, because they tend to evolve incrementally. In the longer term, however, they become unpredictable. The results of this study offer anecdotal evidence of medium term predictability due to institutional path dependence, indicated by self-reinforcing initial informal institutions and institutional regimes and by sunk costs. Recent events may result in either path dependence or renewal. The space and sector-specific historical processes of institutional path dependence

have limited the development trajectories within the three case studies. Path renewal in the three case studies has been triggered by a large number of factors within and outside the institutional regimes. It has resulted in major changes in innovation over time..

7.6 DISCUSSION

This section discusses the research findings in relation to past studies and theories. The research results have shown that Yogyakarta, Cape Town and Yiwu have distinctly different institutional regimes, with different innovation outcomes. These differences have been traced in an evolutionary analysis. As the study is limited to one sector and three cases, its findings are explorative and should be treated with care. Weak trade unionism and collective bargaining indicate a relatively limited role of organised labour in economic coordination. Within this context, the study discusses three issues related to innovation of craft exporters in emerging economies.

The first discussion relates to the relative importance of institutional regimes for innovation. Boschma and Frenken (2011) argue that their impact is ambiguous, because firms adopt a large variety of strategies and competences within one institutional regime. As a result, the scholars doubt the relevance of institutional analysis. By contrast, scholars on comparative capitalism argue that institutional regimes have a major impact on the innovation of firms (Hall and Soskice, 2001; Whitley, 2000). This study finds that the institutional regime significantly explains the level and type of innovation of craft exporters in emerging economies. It therefore confirms the argumentation of comparative capitalism and adds that institutional regimes may also explain whether a territory specialises in product versus process innovation. More specifically, it shows that the institutional make up explains why Yiwu specialises in process innovation and imitation, Cape Town in product innovation and Yogyakarta in a medium level of product and process innovation.

The concrete contribution of the study to the theory on comparative capitalism lies in its multi-spatial and multilevel approach. Most scholars define and operationalize institutional regimes at a national level (see for instance: Allen and Aldred, 2009; Carney *et al.*, 2009; Crouch, 2005; Griffith and Zammuto, 2005; Haake, 2002; Hall and Soskice, 2001; Whitley, 1992; Whitley, 2000; Witt and Redding, 2013; Wood and Frynas, 2006; Wood *et al.*, 2011). This study argues that firms in emerging economies depend to varying degrees on international markets as well (Coe *et al.*, 2004; Lane, 2008; Schneider, 2009), and therefore the

international networks of firms also condition their performance. At the same time, the study argues that there is considerable variety between regions and sectors within a country (Allen and Aldred, 2009; Crouch *et al*., 2009; Witt and Redding, 2013). It is therefore worthwhile to study the specific local institutional regimes of craft exporters as well. As a result, the study adopts a multi-spatial analysis, analysing how international, national and local institutions and actors condition the performance of craft exporters. This multi-spatial approach to institutions enables a more fine-grained analysis (Schneider and Paunescu, 2012). The study results show that these multi-spatial, fine-grained institutional regimes to a significant degree explain differences in innovation outcomes in the three case studies. I highly recommend more research using a similar approach.

A second point for discussion relates to the importance of considering institutional regimes in international comparative analysis. The research findings show that the coherence and complementarity of institutions explain innovation outcomes of craft exporters, rather than each individual institution alone. Chapter 2 furthermore discusses that institutions are also nested (Amable, 2000; Helmsing, 2013; Rafiqui, 2009; Williamson, 1995): the business system conditions the innovation system, which conditions firm characteristics. Therefore, the research findings also show that business system theory may explain innovation more powerfully that innovation system theory alone. If one only considers the systemic coordination of knowledge, without considering economic coordination among local and global actors more broadly, then it is hard to explain territorial differences between Cape Town, Yogyakarta and Yiwu. At the same time, the study also confirms that institutions condition rather than determine innovation outcomes (Boschma and Frenken, 2011), because they allow for local experimentation, variety and agency (Martin, 2010; Rafiqui, 2009). The regression analyses show that innovation outcomes of craft exporters in emerging economies also depend on the governance of global value chains, firm ownership, firm competences and financial borrowing.

A third discussion relates to evolution of mature industries. Path dependence in mature industries is often perceived to be likely, but dangerous and unwanted. Redundant institutions, vested interests and sunk costs are expected to lead to path destruction, whereby old industries disappear and new industries emerge (Boschma and Frenken, 2006; Essletzbichler and Rigy, 2007; Geels, 2004; Lambooy and Boschma, 2001; Martin and Sunley, 2006; Notteboom *et al.*, 2013). The study indeed finds anecdotal evidence of institutional path dependence: selected initial informal institutions are seen to be irreversible and self-reinforcing, institutional regimes are also seen to self-reinforce themselves and sunk costs create incentives to continue along the same development path. Institutional path dependence results in a level of institutional hysteresis and a reduction of potential

development trajectories. However, within the confines of institutional path dependence, the three case studies under review have also shown a remarkable ability to renew themselves (see also Martin, 2010). The research findings indicate that informal institutions and in particular entrepreneurship and ties of trust are path dependent, and therefore strongly influence the direction of development. At the same time, formal institutions and institutional arrangements change more frequently and may therefore create flexibility and heterogeneity. The combination of path-dependent informal institutions, the incremental change of formal institutions and actors, and market volatility and shocks may lead to heterogeneous and ambiguous institutional regimes. Once heterogeneity and ambiguity reach a tipping point, the development path may be destructed or renewed. In such cases, a new institutional regime emerges and innovation outcomes change radically.

The research findings show that development paths were renewed in the period 1980–1990. During this period, international craft trade, IT-technologies and national business systems in emerging economies changed simultaneously: craft markets diversified and grew rapidly (UNCTAD, 2013), global value chains became more relational (Gereffi, 2014), IT-technologies reduced costs of innovation in marketing and services (Luchetti and Sterlacchini, 2004; Hsieh and Lin, 1998), economies of all three case studies opened up and new industrial policies were set. However, the rapidly growing export market of crafts did not just settle anywhere, as in a virgin institutional environment (Nelson, 1994; Boschma and Frenken, 2006; Scott and Storper, 2007). Instead, the presence of institutions determines where craft exports emerge and prosper.

Presently, the institutional regimes appear to become more heterogeneous and ambiguous once again. Governments and intermediary organisations increasingly introduce innovation policies and programmes. At the same time, the international and domestic craft markets change markedly, as product cycles become shorter, domestic markets in emerging economies grow in size, and price competition in international markets builds up (Gereffi, 2014). These trends push towards a higher level of innovation. Innovation of craft exporters is also incentivized by the decreasing knowledge gap with global buyers: because they have less to learn from global buyers, local innovation is incentivised (Dutrénit, 2007). However, despite growing institutional heterogeneity and ambiguity, we note that firm strategies and competences have not yet changed radically. As Dutrénit (2004) and Teece (2007) note, it may be risky for firms to move from absorbing knowledge to innovating. This transition demands investments in R&D and marketing, and most likely switching to other global value chains and knowledge partners (Saliola and Zangfei, 2009). It may be easier for new firms to enter the scene, because they are less institutionalised, and may therefore be more receptive to new development

trajectories (Sternberg, 2007; Sternberg and Muller, 2005). This demands more research.

7.7 CONCLUSIONS AND FINAL CONSIDERATIONS

This study aims to contribute to a better understanding of incremental innovation of craft exporters in emerging economies, based on case studies in Yiwu (China), Yogyakarta (Indonesia) and Cape Town (South Africa). A configurative comparative analysis explores whether innovation outcomes of firms are explained by the distinct institutional regimes within a territory, and/or individual institutions. A second part of the analysis assesses how innovation and institutions evolve over time. As the study only considers one sector and three case studies, its findings are explorative and should be treated with care.

The study adopts the perspectives of innovation systems (Lundvall, *et al.*, 2010), business systems (Hall and Soskice, 2001; Whitley, 1992) and institutional path dependence (Martin, 2010). These perspectives have been integrated into an analytical model, which is multilevel, multi-spatial and dynamic (chapter 2). The study results show that the model enables an exploration of incremental innovation, but it also has its drawbacks: the concepts used are potentially ambiguous, because they are defined and operationalized differently by scholars, data collection is expensive and time consuming, and the large number of factors may create a 'degrees of freedom' problem. These challenges have been addressed methodologically by adopting a multiple-case-study approach with a detailed operationalization, a comparative configurational analysis (Mollinga and Gondhalekar, 2014) and a 'fuzzy-set ideal type' methodology (Fiss, 2007; Kvist, 2007; Schneider *et al.*, 2010). Furthermore, the evolutionary analysis has remained descriptive due to lack of data.

A second conclusion is that the institutional regimes of craft exporters in emerging economies vary in space and time. The research findings show that the variety in institutional regimes to a significant degree predicts innovation differences among firms, but also allows for variety within. This conclusion is in line with theory on business systems (Allen and Aldred, 2009; Carney *et al*., 2009; Crouch, 2005; Griffith and Zammuto, 2005; Haake, 2002; Hall and Soskice, 2001; Schneider, 2009; Whitley, 1992; Whitley, 2000; Witt and Redding, 2013). It adds two novelties: (1) the study has made the analysis more fine-grained by considering institutional regimes as multi-spatial and multilevel; (2) the research findings show that the business system conditions innovation systems and firm strategies and competences.

A third conclusion is that the institutional regimes may evolve in processes that combine institutional path dependence and path renewal. As Martin and Sunley (2006) argue, development paths are not set in stone. I argue that institutional regimes are dynamic for three reasons. First, sunk costs in handicrafts are relatively low. As a result, institutional regimes are not as 'hard' as in more capital-intensive industries (Geels, 2004). Second, path renewal during the 1980s and 1990s may have been enabled by weak institutions in handicraft exports. Third, formal institutions and actors in craft exports in emerging economies appear to be quite adaptive. Therefore, I conclude that incremental change and path renewal may be relatively viable in handicraft exports in emerging economies due to adaptable and/or weak institutions and relatively low sunk costs.

A fourth conclusion is that balanced firm competences lead to a higher level of incremental innovation irrespective of the institutional regime. However, innovation systems may not always create incentives for balanced competences: in Cape Town it is skewed towards product innovation and in Yiwu towards process innovation. Skewed competence building increases the odds of skewed innovation.

Three recommendations flow from the above. First, as this study is limited in scope I highly recommend more research. A configurational comparative analysis based on multiple case studies with a fuzzy-set analysis has been shown to be able to link theory on configurations to research (Fiss, 2007). Case studies can be selected using Mill's Method of Difference, in order to enable generalisations. A mixed methodology offers a rich source of data. Preferably, quantitative time series over a long period of time would ease the mapping and analysis of evolutionary processes.

Secondly, the study recommends continued policy attention to competence building in craft exports in emerging economies, because this is likely to stimulate innovation irrespective of the institutional regime. An important aspect of competence building is attracting new firms with educated and experienced entrepreneurs. More research is recommended in order to validate the finding across sectors and territories.

A final recommendation is to base innovation policies on applied local research. As each institutional regime represents a unique combination of institutions and actors, they condition innovation differently. The greater the differences in institutional regimes among handicraft exporters in emerging economies, the greater the differences in innovation outcomes may be.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

This study explains incremental innovation of craft exporters in emerging economies using an exploratory multiple case study strategy and a mixed research methodology. Initially, it adopts the perspective of innovation systems (Edquist, 2001; Lundvall *et al.*, 2010). This perspective has significantly contributed to the understanding of innovation and the spread of innovation studies and policies (Edquist, 2001; Goel, 2004; Lundvall *et al.*, 2010). As an analytical tool, it has enabled me to successfully analyse the first case study on Yogyakarta, but, to my surprise, the analyses did not yield any significant result in the other two case studies and the comparative analysis.

Following the logic of exploratory multiple research, I delved into other perspectives within the academic realm of evolutionary institutional economics, and found the perspectives of business systems (Whitley, 1992 and 2000) and institutional path dependence (Martin, 2012; Martin and Sunley, 2006) to be most relevant. The three perspectives are positively but critically reviewed in chapter 2. I find that all have merit, but are underdetermined and descriptive. The perspectives have subsequently been combined into a new exploratory model with more explanatory power. The exploratory model is multilevel, multi-spatial and dynamic, as recommended by a quickly growing group of scholars (Allen and Aldred, 2009; Binz *et al.*, 2014; Dicken *et al.*, 2001; Hall and Thelen, 2009; Lane, 2008; Martin and Sunley, 2006; Martin 2010 and 2012; Pietrobelli and Rabellotti, 2011; Schneider and Paunescu, 2012; Strambach, 2008). The research question captures the broadened scope of the study: *How do evolving institutional regimes explain the incremental innovation of craft exporters in emerging economies?*

The main strength of the study lies in its open exploration of theoretical perspectives across different institutional contexts. This has resulted in the development of an exploratory model that integrates the three perspectives. Its main weakness lies in the fact that the research findings have to be interpreted with care. The case studies illustrate the relevance of the exploratory model, but do not sufficiently test it. This is partially caused by the research strategy itself. The case studies answer different research questions and therefore their results can not easily be compared. This weakness has been addressed in the comparative analysis, which compares the case studies based on the main research question. It is also partially caused by the small number of case studies and the diversity of the

handicraft sector. The weakness is addressed by controlling for sectoral diversity, which is a common practice in innovation studies. However, the study can not exclude that a fourth case study would demand the inclusion of another academic perspective once again. A third weakness is that the external validity of case studies is by definition limited to theoretical generalisation.

This concluding chapter presents and discusses the main academic contributions of the study. The chapter is structured as follows. Section 8.2 discusses the main findings and briefly answers the main research question. The subsequent chapters discuss the research findings more in depth and aim to draw analytical generalisations on incremental innovation in emerging economies. They discuss the institutional regime and institutional path dependence respectively. Sections 8.5 and 8.6 reflect on the exploratory model and research methods. Finally, the chapter makes research and policy recommendations.

8.2 MAIN FINDINGS

Based on an initial literature review, I expected that the perspective of innovation systems would explain innovation differences between firms and territories. I was proven wrong. Instead, I found that the innovation-system perspective does not always enable an explanation of innovation differences between and within case studies. In hindsight, the reasons are manifold: incremental innovation of craft exporters does not only depend on innovation systems, but also on higher order production systems and lower order firm strategies and competences; scholars tend to use the innovation system perspective in a descriptive sense; most scholars study radical product innovations in developed economies; and the evolution of innovation systems is hardly studied at all. The study therefore concludes that the perspective of innovation systems offers a relevant but insufficient perspective on incremental innovation of craft exporters in emerging economies.

The institutional factors that significantly influence incremental innovation of craft firms in Yogyakarta, Cape Town and Yiwu are the institutional regime and global value chains in which they operate, as well as specific firm strategies and competences. The finding that the institutional regimes to a significant degree explain innovation of craft exporters confirms business system theory (Hall and Soskice, 2001; Whitley, 2000). However, contrary to the common definition of business systems, the business systems of craft exporters are defined as multilevel, multi-spatial and dynamic. Research findings show that the way in which international, national and local actors coordinate a local economy greatly impacts on the innovation outcomes of craft exporters in the three case studies. The reason

behind this finding is that the business systems of the three case studies are poles apart: in Cape Town, the government strongly coordinates the formal economy, but conspicuously excludes informal firms; in Yiwu, the local economy depends predominantly on strategies of global buyers; and in Yogyakarta, global, national and local actors play roles in coordinating the local economy.

The impact of global value chains on innovation confirms the contemporary perspective on global value chains (Gereffi, 1999 and 2014; Gereffi *et al*, 2005; Humphrey and Schmitz, 2002; Kaplinsky and Morris, 2000; Sturgeon *et al.*, 2008). The findings illustrate that quasi-hierarchical global value chains are likely to increase the odds of process innovation, while reducing the odds of product innovation. Relational global value chains tend to have the opposite effect. By the same token, the research findings illustrate that subsidiaries of multinationals or large national firms may be more likely to innovate production processes. This indicates that parent companies may stimulate low-cost production of crafts, while keeping a hold on branding, design and marketing.

The impact of firm competences on innovation confirms the perspective on absorptive capacity (Cohen and Levinthal, 1990; Zahra and George, 2002). Firms require the capacity to acquire, assimilate, transform and exploit new knowledge. Balanced competences enable firms to innovate products and to develop related production processes and marketing strategies. This indicates an advanced level of absorptive capacity (Dutrénit, 2004 and 2007). By contrast, skewed competences tend to coincide with a lower level of product and/or process innovation. It indicates a basic or at best a transitional level of absorptive capacity, which makes it harder to commercially exploit new products and/or processes (Dutrénit, 2004 and 2007). Furthermore, a higher level of education of entrepreneurs is likely to coincide with more product innovation, while financial borrowing is likely to coincide with process innovation.

The institutions impacting on innovation do not appear out of the blue. The research findings indicate that these are likely to evolve in historical processes that are irreversible and unique to the territory and sector. In mature industries, sunk cost, vested interests and institutional rigidities are expected to lead to institutional path dependence and/or destruction (Boschma and Frenken, 2006; Geels, 2004; Martin and Sunley, 2006). The research findings do indeed show that institutions tend to evolve in path-dependent, irreversible and predictable patterns most of the time. However, these periods of relative stability are intertwined with periods of path renewal. It would appear that, at least in some territories, the mature sector of handicrafts in emerging economies can and does renew itself.

8.3 INNOVATION SYSTEMS

This study defines innovation systems as knowledge interactions among firms, government and intermediary organisations such as business associations and universities (Tödtling *et al*., 2009). Generally speaking, studies on innovation systems centre around radical innovation in developed economies. They are rarely concerned with incremental innovation of low-tech exporting industries in emerging economies, let alone of craft exporters. I therefore positively but critically assess to what extent and how the innovation system perspective is applicable to craft exporters in emerging economies.

Scholars perceive innovation systems to be local in the first place, because firms first search for knowledge in territories with which they are most familiar (Asheim *et al.*, 2002; Asheim and Isaksen, 2002; Belusi and Sedita, 2012; Boschma, 2005; Cooke, 2001; Doloreux and Parto, 2005; Gertler *et al.*, 2000). However, the study findings show that craft exporters also acquire knowledge from global value chains, the Internet and other sources outside the territory. The main reason is that cutting-edge knowledge is scarce within the three case studies. This leads to the conclusion that innovation systems of craft exporters in emerging economies tend to combine global, national and local knowledge, whereby they especially depend on knowledge acquired from global buyers. The impact of global vale chains on innovation is far from straightforward. The research findings furthermore show that the innovation systems of the three case studies have distinctly different network properties and capacities. The remainder of this section discusses the conclusions in greater detail.

8.3.1 INNOVATION SYSTEMS OF CRAFT EXPORTERS IN EMERGING ECONOMIES

The research findings show that innovation systems of craft exporters in emerging economies can adopt different network properties and capacities. First I will briefly describe their network properties. The most important knowledge networks of craft exporters are global value chains and local innovation systems, the Internet, trade fairs, periodicals and communities of practice. The innovation systems integrate these multi-spatial knowledge networks. Others scholars report on similar sources of knowledge of firms in emerging economies (Binz *et al.,* 2014; Lall, 2003; Gereffi *et al*., 2014; Altenburg *et al.*, 2008; Chaminade and Vang, 2008). Depending on the combination of sources, the innovation systems are primarily local, global, or a mix of the two (Binz *et al*., 2014). Primarily local innovation systems have strong local knowledge networks and occasional and relatively weak non-local connections (Binz *et al*., 2014). Primarily global innovation systems

depend on the knowledge of global buyers and have occasional and relatively weak local connections. The research findings show that Cape Town is primarily a local innovation system, weakly connected to global value chains, Yiwu is primarily a global innovation system with weak local knowledge networks, and Yogyakarta combines the two.

The innovation systems also differ with respect to their capacities and competences. When an innovation system emerges, local actors are likely to be relatively weak and knowledge exchange may be restrained (see also Chaminade and Vang, 2008; Dutrénit, 2004). These actors include firms, (local) government, business associations, universities and other local partners. With limited local capacities, exporting firms tend to acquire knowledge mainly from global value chains; most likely (quasi-) hierarchical global value chains, as they are unlikely to be able to compete in relational global value chains (Chaminade and Vang, 2008; Gereffi *et al*., 2005; Pietrobelli and Rabellotti, 2011). Research findings illustrate that Yiwu is, in essence, a rather weak innovation system, because firms depend on knowledge from global value chains. As innovation systems evolve and gain in strength, they increasingly enable firms to acquire cutting-edge knowledge, while at the same time diffusing knowledge. Firms are also capacitated and increasingly able to balance their absorptive capacities (Dutrénit, 2004). Yogyakarta illustrates such an emerging innovation system, whereby global and local knowledge is combined and widely diffused. Finally, a well-developed innovation system is a well-structured and efficient local system that stimulates incremental and radical innovation (Pietrobelli and Rabelloti, 2011). The capacity of firms slowly transfers from absorbing external knowledge to internal R&D. While most innovation systems in emerging economies are still at lower levels of development (Chaminade and Vang, 2008), the research findings suggest that the formal local innovation system in Cape Town is relatively well developed. Radical innovation is in this case taken to include *´out-of-the-box´* product designs, developed in internal R&D processes.

8.3.2 THE ROLE OF GLOBAL VALUE CHAINS

The research findings show that the integration into and governance of global value chains significantly impact on innovation of craft exporters in emerging economies, but its impact is likely to be non-linear. On the one hand, the findings illustrate that global value chains have a linear impact on innovation, as is illustrated by the significant effect of their governance on the level of product and process innovation of craft exporters. On the other hand, the findings show that global value chains have an indirect impact as they co-shape the business and

innovation system of the craft exporters in the case studies. Its impact may also be mediated by the firms' absorptive capacities.

Scholars argue that the deeper firms are integrated into global value chains, the more their business system may depend on orders and knowledge from global buyers (Lane, 2008; Nölke and Vliegenthart, 2009; Schneider, 2009). If the role of local actors in economic coordination is weak, this may lead to skewed process innovation (i.e. a dependent economy). By contrast, if the role of global buyers is counteracted by a strong role of local actors, it may create incentives for product and process innovation (i.e. a joint economy). The level of integration also influences the innovation system: a deeper integration into global value chains may lead to better access to knowledge of global buyers. Whether firms are able to reap the benefits of increased access or not, is likely to depend on the governance of global value chains and the ability of the local innovation system to diffuse knowledge. If global value chains are (quasi-) hierarchical, it stimulates process innovation, and if they are relational it may explain product and process innovation (Gereffi *et al*., 2005; Pietrobelli and Rabellotti, 2011).

The research findings in Yogyakarta illustrate that absorptive capacities of firms may mediate the impact of global value chains on innovation. The importance of competences of local firms is acknowledged by Gereffi *et al.* (2005), but the processes remain hidden as the firm is treated as a black box. Chapter 4 has illustrated that it may be useful to open the black box. More research on the linkage between global value chains and national or local institutional regimes is recommended.

8.3.3 Innovation systems as nested institutions

The study holds that institutions impacting on innovation are nested (Rafiqui, 2009; Williamson, 2000), whereby innovation systems are but one layer of the institutional regime. The study findings show that the high-order economic coordination between global buyers, governments, intermediary organisations and local firms has a significant impact on the craft exporters' innovation levels in the three case studies.

To my knowledge, the application of a hierarchical and nested framework to study innovation is novel. It has three advantages: (1) The concepts of business and innovation systems can be retained by separating the basic institutions coordinating a local economy from those conditioning knowledge exchange. As a result, the perspectives can more easily be combined; (2) The nested approach potentially eases an evolutionary analysis: business systems are likely to change

only slowly, because the role of actors is entrenched in industrial policies, regulations, norms and values (Williamson, 2000); innovation systems change at a medium pace, since firms can change their networks within the constraints of innovation policies, regulations, norms and values (Dosi *et al*., 2006; Rafiqui, 2009). Knowledge networks are less 'hard' than production networks, because they have lower sunk costs (Geels, 2004); and firm strategies and competences can change somewhat more swiftly (Rafiqui, 2009; Williamson, 2000); (3) The relative importance of and co-relations between nested institutions can potentially be studied. The latter has however not been the focus of this study.

8.3.4 A TYPOLOGY OF INNOVATION SYSTEMS

The study proposed a typology of innovation systems of craft exporters in emerging economies, based on the four ideal-type institutional regimes that are detailed in section 2.5.4 and empirically studied in chapter 7. It links the perspective of institutional regimes to the multi-spatial innovation systems proposed by Binz *et al.* (2014). Firms in a territory may strongly or weakly network within global value chains and/or the local innovation system (see figure 8.1). The research results suggest that the distinct network properties are likely to have distinct mechanisms leading to innovation and innovation outcomes. It must be noted that in every-day life, innovation systems combine elements of all ideal types. The typology can function as a yardstick in analysing innovation systems in emerging economies.

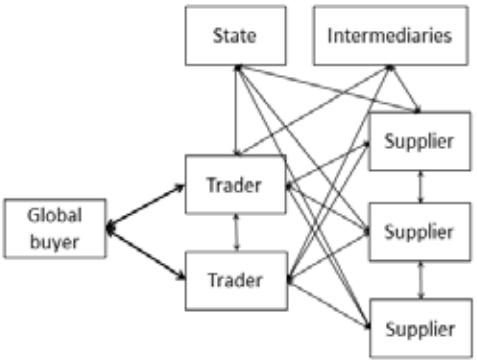
Figure 8.1 Typology of innovation systems

		Global value chain	
		Strong	Weak
Local innovation system	Strong	1. Joint innovation system	3. State innovation system
	Weak	2. Dependent innovation system	4. Market innovation system

Joint innovation system

In a joint innovation system, firms combine knowledge from global value chains and the local innovation system (figure 8.2). The system is likely to be found in joint economies, where global, national and local actors all strongly influence systems of production and knowledge. Traders may function as technological gatekeepers (Giuliani, 2011), linking global buyers to suppliers with lower levels of capacity (Chiaversio *et al.*, 2010). They acquire global knowledge, adding to the accumulated knowledge of the territory. Strong local network properties enable local knowledge diffusion through subcontracting, knowledge exchange and spillover.

Figure 8.2 Joint innovation system



Yogyakarta moderately resembles a joint innovation system, whereby research findings show that firms combine global and local knowledge and traders function as technological gatekeepers. However, the innovation system is not very strong, because the capacity of local non-firm actors is relatively limited. The research findings also show that the impact of global value chains on innovation is mediated by the absorptive capacity of firms. A firms' weak absorptive capacity therefore limits its ability to innovate. Mediation, proven by Baron and Kenny's model (1986), takes four forms. First, capacitated traders add to the local pool of knowledge by acquiring and assimilating knowledge from global buyers. Second, the ability of traders and suppliers to acquire and assimilate new knowledge mediates their ability to translate new knowledge into innovations. Third, the ability of firms to combine global and local knowledge impacts on innovation, and finally, the ability of firms to combine product and process innovations determines their ability to innovate (see also Giuliani, 2007 and 2011).

Dependent innovation system

Suppliers operating within a dependent innovation system strongly depend on knowledge from global buyers, multinationals and/or local corporations (figure 8.3). The dependent innovation system is likely to be found in dependent economies, where global buyers and multinationals strongly influence local economies, while national and local economic coordination is liberal or weak

(Nölke and Vliegenthart, 2009; Schneider, 2009). Local knowledge exchange is expected to be weak, even though the level of knowledge spillover through copying may be quite high. This innovation system incentivises process innovation, as global buyers are likely to keep hold of brands, designs and marketing networks (Gereffi *et al*., 2005).

Yiwu strongly represents a dependent innovation system, but it also has its own peculiarities such as the presence of a large commodity market and the presence of global buyers.

State innovation system

A state innovation system combines a strong local innovation system, supported by the government and intermediary organisations, with weak connections to global value chains (figure 8.4). Such innovation systems are most likely within state economies, where the state strongly coordinates economic activities and the integration in international trade is weak or arm's-length. The spatially dense and trustful collaborative knowledge interactions within a territory, in combination with distant and complementary ideas from open international knowledge networks, explain a high level of product innovation (Fleming *et al*., 2007 in Binz, 2014: 141).

Cape Town strongly represents a *segmented* state innovation system (figure 8.5). The formal network in Cape Town is characterised by strong ties of association

Figure 8.3 Dependent innovation system

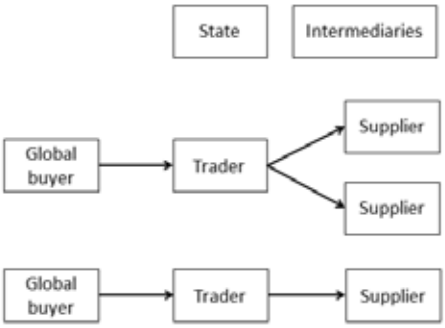


Figure 8.4 State innovation system

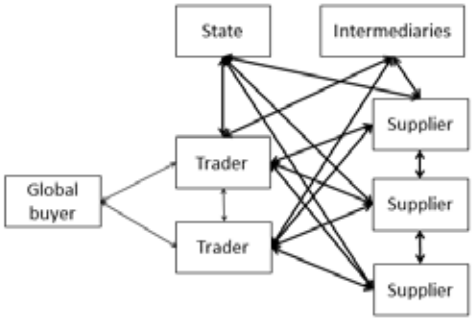
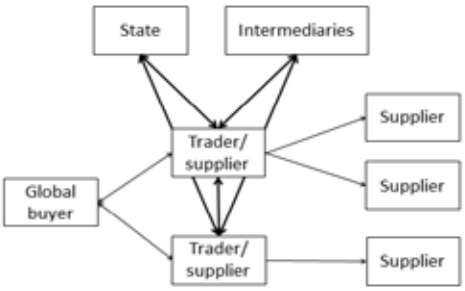


Figure 8.5 Innovation system in Cape Town

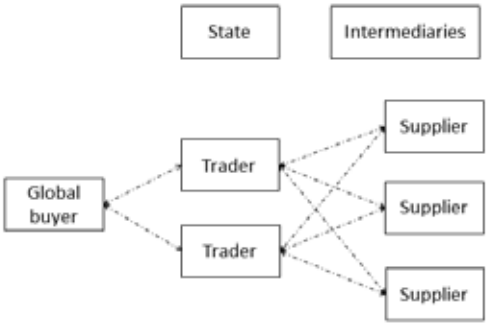


among formal firms, a university, a proactive government and strong intermediary organisations. At the same time, the history of apartheid and colonialism has created a persistent segmentation, whereby informal firms are de facto excluded from the local innovation system. The segmentation limits the number of actors and interactions within the innovation system. This limited breadth of the innovation system is likely to reduce the level of innovation of the system as a whole.

Market innovation system

In the fourth model, competition and rivalry create incentives for incremental innovation, but at the same time knowledge exchange is limited to market transactions and formal contracting (figure 8.6). It is likely to be found in liberal market economies with weak or arm's-length international trade. Firms innovate in relative isolation, and may either forego the innovation risk, or innovate '*out-of-the-box*' instead of incrementally. Either way, incremental innovation is unlikely (Crouch, 2005; Hall and Soskice, 2001).

Figure 8.6 Market innovation system



Research findings show that all case studies moderately resemble a market innovation system (see section 7.3). The reason is that competition and rivalry play important roles in the innovation processes of firms.

8.4 INSTITUTIONAL REGIMES

Institutional regimes comprise of institutions with similar features that are bound together (Crouch, 2005), which creates coherence (Amable, 2000) and increasing returns (Hall and Soskice, 2001). This perspective, as propagated by among others Whitley (1992) and Hall and Soskice (2001), has greatly contributed to our understanding of innovation. However, institutional regimes are generally defined at a national level. Instead, this study proposes a multilevel and multi-spatial perspective. The study results show that differences in the multilevel institutional regimes of Yiwu, Cape Town and Yogyakarta to a significant degree explain differences in innovation levels of the craft exporters. Other research findings

relate to the institutional factors that explain a territorial specialisation in either product or process innovation, and the segmentation of the business system in Cape Town.

8.4.1 MULTILEVEL INSTITUTIONAL REGIMES

A quickly growing number of scholars argue for multi-spatial and/or multilevel analysis of institutional regimes (Allen and Aldred, 2009; Coe *et al*., 2004; Crouch *et al*., 2009; Ernst, 2002; Ernst and Kim, 2002; Essletzbichler, 2009; Henderson, 2004; Henderson *et al*., 2002; Lane, 2008; MacKinnon *et al*., 2009; Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009 Schneider and Paunescu, 2012). This study illustrates a multi-spatial and multilevel analysis of the institutional regimes of craft exporters in emerging economies and the effect on the craft exporters' level of innovation.

Generally speaking, business systems are defined and categorised at the *national* level. The seminal work of Hall and Soskice (2001) identifies two business systems, Griffiths and Zammuto (2005) identify four business systems, and Whitley (2000) even recognises six distinct business systems. Various scholars add yet other business systems, some of which are assumed to be specific to Asia, Eastern Europe, Latin America or Africa (see for instance: Carney *et al*., 2009; Crouch *et al*., 2009; Nölke and Vligenthart, 2009; Schneider, 2009; Witt and Redding, 2013; Wood and Frynas, 2006). These national business systems are expected to have specific and distinct mechanisms leading to innovation.

However, business systems in emerging economies are not completely determined at the national level, but are also influenced by the international and local networks of firms, and the institutions and actors that embed them. Emerging economies depend to varying degrees on decisions of actors outside their territory (Lane, 2008). The research findings indicate that dependence on global buyers can condition the strategies and competences of craft exporters in emerging economies. The case of Yiwu illustrates that dependence on orders and knowledge of global buyers, in combination with relatively liberal local coordination, may condition craft exporters to innovate processes instead of products. Similar findings are reported in other dependent economies (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009). At the same time, *local* networks, actors and institutions may differ from those at the national level and offer distinct innovation opportunities. This is illustrated by the difference between China's ambitious national innovation policies and its lack of application to handicraft exporters in Yiwu (Choi *et al.*, 2011; Fu and Gong, 2011; Tang and Hussler, 2011). By contrast, Cape Town's and Yogyakarta's local industrial and

innovation policies and programmes are relatively strong compared to the national level (DTI, 2005; Fransen and van Tuyl, 2017).

The specific business system of craft exporters in a certain territory may differ substantially from the mainstream national business system, due to their particular local and international networks. These differences are also reported by other scholars (Allen and Aldred, 2009; Crough, 2009; Lane, 2008; Strambach, 2008; Witt and Redding, 2013). By studying the business systems of craft exporters in their specific local, national and international context, a more fine-grained analysis can be conducted (Schneider and Paunescu, 2012).

Institutional regimes also constitute multiple institutional levels (Amable 2000; Helmsing, 2013; Rafiqui, 2009; Willamson, 2000). This study proposes and applies three institutional levels: business system, innovation system and firm strategies and competences. Higher levels of institutions are expected to condition lower levels, leading to likely innovation outcomes. The levels within the institutional regimes of the three case studies are more or less aligned[9], but as expected firms have a variety of strategies and competences within institutional regimes (Lundvall, 2007).

8.4.2 The impact of institutional regimes on innovation

There is a lively academic debate on the impact of institutional regimes on innovation, which focuses on national differences between radical and incremental innovation (Allen and Aldred, 2009; Crouch, 2005; Ernst, 2007; Griffiths and Zammuto, 2005; Hall and Soskice, 2001; Nölke and Vligenthart, 2009; Sánchez-Ancochea, 2009; Whitley, 2009). By contrast, this study explores the impact of multilevel institutional regimes on product versus process innovation within one sector in three specific territories within countries. Similar studies have been conducted by Crouch *et al.* (2009), Ernst (2007), Lane (2008), Schneider (2010) and Strambach and Storz (2008), but none of these focuses on product and process innovation.

The analysis first maps to what extent the institutional regimes resemble the identified ideal types in a fuzzy-set analysis (chapter 7; Fiss, 2007; Kvist, 2007; Schneider *et al.*, 2010). The results show that Yogyakarta moderately resembles a joint economy, as its economy is coordinated by global buyers, (local) government and intermediary organisations. However, I find that the limited capacity of the local government and intermediary organisations somewhat reduces their ability

[9] As indicated by comparable membership scores on ideal types in table 7.4.

to coordinate and steer the local economy. As a result, the average level of product and process innovation of firms is moderate. Yiwu strongly resembles a dependent economy. While its institutional regime has its peculiarities, the average level of innovation is as expected: a high level of process innovation versus a low level of product innovation. Cape Town strongly resembles a state economy and, as expected, its level of product innovation is high and that of process innovation is low.

The second step of the analysis assesses if differences in institutional regimes explain innovation differences between firms. The regression analysis, which applies a contextual effects model, assesses if differences in institutional regimes explain innovation differences, instead of independent or control variables separately (Mollinga and Gondhalekar, 2014). The regression analysis shows that the differences in institutional regimes significantly explain the firms´ innovation levels and that some individual factors influence innovation as well (governance of global value chains, balanced firm competences and then education level of the entrepreneur).

8.4.3 PRODUCT VERSUS PROCESS INNOVATION

The difference between product and process innovation has important implications for firms. Generally speaking, product innovation creates product rents, in the form of higher prices, while process innovations enable firms to increase production volumes, improve product quality and reduce costs (Edquist *et al.*, 2001). Process innovation may result in a race to the bottom if prices and profit margins reduce, while production volumes increase (Kaplinsy and Morris, 2001; Malecki, 2004; Meyer-Stamer, 2004).

The study finds significant differences in product innovation between the three case studies: craft exporters in Cape Town have a high level of product innovation and a low level of process innovation, firms in Yiwu have the reverse innovation levels and firms in Yogyakarta innovate both. In their seminal work, Utterback and Abernathy (1975) explain that product innovation takes place at the initial stage of the product cycle and process innovation at its later stages. Indeed, the study illustrates that some of the crafts designed in Cape Town were mass-produced in Yiwu. Some Cape crafters have also relocated production to China. While this explanation is insightful, it does not clarify why some territories are specialised in product innovation at initial stages of the product cycle, and others in process innovation at later stages.

As discussed in the previous section, the study results illustrate that differences in the institutional regimes may explain differences in product and process innovation of craft exporters. They show that Yiwu strongly resembles a dependent economy, whereby its craft exporters depend on orders and knowledge from global buyers. Local knowledge exchange with the government and intermediary organisations is relatively weak. While the government retains a strong hold on resources that firms need, its innovation policies for craft firms are still relatively weak (Choi *et al*., 2011; Fu and Gong, 2011; Tang and Hussler, 2011). Most firms strategically focus on process innovation in order to remain competitive. This process innovation is furthered by risk-averse strategies of Chinese family firms (Qi, 2000; Wang, 2013; Wang and Lin, 2013). Empirical studies in South America and Eastern Europe also conclude that dependent economies can be treated as a separate business system that incentivizes process innovations (Nölke and Vliegenthart, 2009; Sánchez-Ancochea, 2009; Schneider, 2009). My research findings confirm the argument that dependent economies are a specific business system, which is likely to condition process innovations.

By contrast, the research findings show that skewed product innovation in Cape Town takes place within an economy, which strongly resembles a state economy. It is strongly coordinated by local government, and intermediary actors. Firms, the local government, research institutes and intermediary organisations exchange knowledge reciprocally. At the same time, firms are demotivated to move to scale through process innovations, because of the limited exports and relatively small local market. Instead, firms focus on product innovations. The research findings illustrate that state economies may condition skewed product innovation, but this finding is not backed up by other empirical studies. More research is recommended.

Craft firms in Yogyakarta combine product and process innovation. Study results show that Yogyakarta moderately resembles a joint economy, which is coordinated by international, national and local actors. More research is recommended in order to test if joint economies condition a mix of product and process innovation.

8.4.4 Segmented institutional regimes

Various scholars have studied segmented institutional regimes within countries (Pedersen and McCorminck, 1999; Witt and Redding, 2013; Wood *et al*., 2011; Wood and Frynas, 2006). I have borrowed the concept in order to explain sustained differences in the innovation of craft exporters in Cape Town. The application of the concept to innovation and to the South African context is novel.

It shows that the business system can also be segmented at a local, sectoral level, and that it may have a lasting impact on firms' innovation outcomes.

The study results show that Cape Town's institutional regime is deeply segmented between formal and informal craft firms. They have significantly different modes of economic coordination, innovation systems and firm characteristics. The business system within which formal firms operate is strongly coordinated by the government, intermediary organisations and local firms. Compared to informal firms, they are large and capacitated, and its entrepreneurs are highly educated, driven by profit or by creativity. Their level of product innovation is high. By contrast, informal firms in Cape Town tend to operate within a dependent economy, coordinated by formal firms operating as traders in value chains. They are ignored by government and mainly network with local buyers. Firms are small and most entrepreneurs are lowly educated, black South Africans, driven by survival. Their level of innovation is low, as they mainly produce products up to specification.

8.5 EVOLUTIONARY FACTORS

While innovation system scholars analyse economic dynamics (i.e. innovations), the dynamics of innovation systems themselves have received remarkably little attention to date (Boschma and Frenken, 2015). This study attempts to explain the present institutional regime and its innovation outcomes from the perspective of institutional path dependence, defined as the recurrence and ergodicity of institutional regimes, which provide stability and predictability (Dosi et al., 2005; Geels, 2004; Rafiqui, 2009; Martin and Sunley, 2006). Two conclusions are drawn. First, the study concludes that innovation systems of craft exporters in emerging economies can evolve in path-dependent patterns, characterised by incremental change (Martin, 2010; Martin and Sunley, 2006). Second, the study concludes that their innovation systems can occasionally renew themselves, which may result in radical changes in innovation outcomes. This finding appears to contradict the assumption that path renewal is unlikely in mature industries, due to sunk costs, increasing return effects, rigid institutions and vested interest. When rigid institutions lose their adaptive abilities, mature industries are expected to relocate. Local development paths are therefore likely to be destructed over time (Boschma and Frenken, 2006 and 2007; Dosi *et al.*, 2005; Essletzbichler and Rigby, 2007; Geels, 2004; Martin, 2010; Martin and Sunley, 2006).

8.5.1 INSTITUTIONAL PATH DEPENDENCE

The research exemplifies three types of path dependence. The first is the irreversible and self-reinforcing effect of initial informal institutions (Martin and Sunley, 2006; Rafiqui, 2009; Williamson, 2000). The study illustrates for all three case studies that the norms and values reflected in entrepreneurship and social ties of trust have been shaped long ago and appear to be self-enforcing and irreversible. In Cape Town, for instance, the segmented innovation system still reflects the segmented ties of trust and differences in entrepreneurial motivations that emerged during colonialism and apartheid, despite major changes in laws, policies, programmes and actors. In Yiwu, risk-averse entrepreneurship of family firms can be traced back to the bartering of brown sugar ages ago (GuaHua, 2000), and are still reinforced despite major policy changes, the introduction of global value chains, the emergence of new actors and two path renewals of the innovation system. In Yogyakarta, reciprocal knowledge exchange within clusters has withstood the introduction of traders and global value chains, major policy changes, and a path renewal. The manifestation of path-dependent initial institutions in entrepreneurial motivation and ties of trust and reciprocity demands more research.

Second, scholars argue that the coherence and homogeneity of the institutional regimes hold institutions together over sustained periods of time (Hall and Soskice, 2001; MacKinnon, 2008; Martin, 2010; Martin and Sunley, 2006). The institutional regime of mature industries is expected to be self-reinforced by institutional hysteresis, as depicted by high levels of inflexibility, predictability and ergodicity of the system itself. The transformation of individual institutions does not necessarily destabilise the whole innovation system (Notteboom *et al.*, 2013). Instead, institutions appear to have a degree of plasticity (Strambach, 2008), whereby rules are reinterpreted over time (Hall and Thelen, 2009).

The study findings illustrate path dependence due to institutional hysteresis. In Yogyakarta, the innovation system was severely shaken by a major earthquake in 2006 and the financial crises since 2008. Actors reinterpreted rules in order to deal with these shocks: central government stepped in after the earth quake and offered financial and managerial support, business associations gained strength in order to represent craft firms, and the level of trust between government, intermediary organisations and firms rose sharply. The local innovation system was strengthened. In the process, formal and informal institutions have been reinterpreted in order to deal with shocks. Yet, the institutional regime as a whole only changed incrementally. In Cape Town, the institutional segmentation is systemically reinforced in complex relationships between entrepreneurial motivations, Cape Towns' segmented spatial structures (Pieterse, 2010), racially

structured social networks (Adato *et al.*, 2006) and education systems (Kruss *et al.*, 2010) and a dysfunctional labour market (Gradīn Lago, 2013). Recent events, such as the subcontracting of production in (quasi-) hierarchical global value chains, reinforce the segmentation.

Third, the study finds anecdotal evidence of sunk costs and its effect on vested interests (Geels, 2004; Martin and Sunley, 2006). Sunk costs are likely to be relatively low in low-tech industries, but its relative importance could not be studied.

8.5.2 PATH RENEWAL

Scholars argue that path renewal is expected to be rare in mature industries, inasmuch as institutions are seen as constraining change (Essletzbichler and Rigby, 2007; MacKinnon, 2008). Instead, it is expected that new development paths emerge in new sectors, where institutional hysteresis does not yet prevent change and adaptation (Boschma and Frenken, 2006; Lambooy and Boschma, 2001; Martin, 2010; Nelson, 1994 and 2002; Scott and Storper, 2007). I turn to the concept of punctuated equilibria, which argues that periods of relative stability are intertwined with periods of configurational change. The institutional environment becomes more heterogeneous and ambiguous over time as rules are reinterpreted, and new rules, actors, markets and technologies emerge (Crouch, 2005; Hall and Thelen, 2009; Martin, 2010 and 2012). When heterogeneity and ambiguity reach a tipping point, firms opt to change their innovation strategies and competences. Innovation outcomes then change fundamentally (Crouch, 2005; Schneider and Paunescu, 2012).

To my surprise, however, the study results show four moments of path renewal. Their directions were restrained by path dependence, but firms nevertheless radically changed their level of product and process innovation. During the 1980s and early 1990s, the innovation systems of all three case studies were renewed. In Yiwu, the innovation system was renewed once again around the start of the new millennium, when firms started exporting on a large scale. The question is whether this finding weakens the notion of institutional hysteresis, or is specific to the sector or the three case studies. Path renewal may be relatively common in handicrafts in emerging economies, due to relatively low sunk costs, weak institutions and rapid social and economic change. However, Schneider and Paunsecu (2009) also note a remarkable level of path renewal in Europe. The study therefore concludes that path renewal deserves more academic attention (MacKinnon, 2008; Martin and Sunley, 2006).

Many factors may cause the balance to tilt in favour of another institutional regime at a certain moment in time. These factors range from changes in formal and informal institutions, to new technologies, new markets, new actors and the agency of actors. Policy reform, as an intended overhaul of formal institutions, may or may not result in path renewal. In Yogyakarta, for instance, export promotion policies and the devaluation of the currency expedited path renewal. In Yiwu, path renewal in the 1980s is associated with the opening up of the economy. In Cape Town, however, the abolition of Apartheid, opening up of export opportunities and a large number of new formal rules did not result in path renewal. Path renewal may also be unintended. The path renewal in Yiwu, around the year 2000, was most likely unintended, as the opening up of exports resulted in industrial downgrading as firms fired their designers and reduced their level of product innovation (see also: Kaplinsky and Morris, 2001; Meyer-Stamer, 2004). More research is recommended in order to assess when and how tipping points of institutional regimes are reached (Crouch, 2005; Schneider and Paunescu, 2012).

8.6 Reflections on the exploratory model

The literature offers a plethora of institutional and evolutionary perspectives explaining innovation, ranging from the old institutional economics of Veblen and Commons to the new institutional economic perspective of Williamson (Hodgson and Stoelhorst, 2014) and from studies on the evolution of firm routines (Nelson and Winter, 1982; Boschma and Frenken, 2011) to the studies considering institutional path dependence (MacKinnon, 2008; Martin, 2010; Martin and Sunley, 2006). Most studies are either institutional or evolutionary. Within the plethora of perspectives, this study adopts the perspectives of institutional regimes, whereby institutions are seen as the rules of the game (Hodgson, 2006 and 2009), and evolutions as institutional path-dependent processes. More concretely, the study combines perspectives on innovation systems, business systems and institutional path dependence. In a small way, the study therefore contributes to the expressed need for combined institutional and evolutionary perspectives (Martin, 2010; Essletzbichler, 2009; MacKinnon, 2008). The combined perspectives are subsequently translated into an exploratory, multilevel, multi-spatial and dynamic model, which has been operationalised and piloted. The research methods are discussed under the next heading.

The study shows that the exploratory model has its strengths and weaknesses. The main strength of the model lies in the fact that is has more explanatory power than each of the three perspectives individually. Contrary to the innovation system perspective, it enables a comparative configurational analysis (Mollinga and

Gondhalekar, 2014). The model in particular enables the exploration of product and process innovation within and between different institutional regimes.

A second strength is that the exploratory framework is multilevel, multi-spatial and dynamic. It assesses the impact of evolving institutional regimes and their institutional layers, on incremental innovation. It also includes the multiple spatial networks in which firms in the global economy tend to operate.

In spite of its strengths, however, the model also has its weaknesses. In the first place, the exploratory model is a work in progress, which still requires comprehensive testing. This study has explored and combined perspectives, but has been unable to sufficiently test the model due to time constraints, inherent limitations of the exploratory research strategy, the limited number of case studies and sectoral heterogeneity. A second weakness is that the model potentially offers freedom after the fact, due to the many factors that potentially explain innovation. This weakness is addressed by a careful operationalisation of the study. Furthermore, data collection is time-consuming, as information is not available in databases. Other strengths and weaknesses of the model relate to the research methodology.

8.7 Reflections on the research methodology

Fiss (2007: 1190) states that there is a mismatch between configurational theory and research, caused by the complex causality and non-linear relationships of variables within configurations. The scholar therefore recommends fuzzy-set analysis based on multiple case study data (see also Kvist, 2007; Rihoux, 2013; Schneider *et al.*, 2010). The study has adopted the recommended research strategy (i.e. multiple case studies) and analysis (fuzzy-set analysis). However, the recommended research methodology has been specified and adjusted in three ways. Firstly, the study does not only make a comparison between institutional configurations, but also analyses innovation differences within each configuration. Due to the non-linearity and complexity of configurations, the three case studies raise different research questions. The study has therefore adopted an exploratory multiple case study approach (Yin, 2009). Secondly, fuzzy-set analysis has been combined with co-variational and qualitative analysis. This combination of analytical tools is viable and does justice to the mixed research methods (for a discussion, see Fiss, 2007). Furthermore, fuzzy-set analysis is not necessarily relevant for analysis within a case study, as the configuration becomes contextual. Thirdly, the study adopts a multilevel perspective, whereby the factors affecting innovation are aggregated to different institutional and spatial levels. The study

applies a contextual effects model, whereby the firm is the unit of analysis and institutional configurations (as measured in a fuzzy-set analysis) are added as contextual firm-level data.

The research methodology has enabled the study to explore three different perspectives on incremental innovation of craft exporters in emerging economies and to incrementally combine the three perspectives into an exploratory model with more explanatory power. However, the chosen research methodologies also have disadvantages:

1) The research strategy makes it harder to interpret and apprehend the thesis. Generally speaking, theses which present multiple case studies raise the same research question(s) and apply the same research methodology across case studies. The results can therefore be compared. In this study, however, each case study raises another research question. The thesis therefore has to be interpreted differently: it illustrates the relevance of different academic perspectives and research methodologies in different institutional contexts, and enables the cumulative and incremental development of an exploratory model.
2) The research findings of an exploratory multiple case study are not as robust as those in a literal or theoretical replication of multiple case studies.
3) Case study research has by definition limited external validity and only allows for theoretical generalisation.
4) The selection of handicrafts as a sector is open to criticism, because it is a diverse, relatively unexplored sector. Its diversity is controlled for and is common practice in innovation studies, but nevertheless weakens internal validity. The reasons why the sector is selected are given in section 2.2.3.
5) The operationalisation of concepts also has its limitations: innovation is measured as its perceived level; business systems, path dependence and path renewal are measured based on a relatively limited number of indicators; and the governance of global value chains is primarily measured based on its transactional dependence. The analysis of institutional path dependence and renewal is of a descriptive nature, due to the absence of quantitative data and the limited academic understanding of these complex processes. The thesis aims to contribute to the understanding of these processes by describing and comparing the evolution of the three case studies.

The weaknesses described above lead to recommendations for further research.

8.8 RECOMMENDATIONS

8.8.1 RESEARCH AGENDA

The study strongly recommends further research in order to test the exploratory model of incremental innovation in low-tech industries. The recommended research question is as follows:

> *How do evolving institutional regimes explain innovation in low-tech industries?*

The recommended study is international in scope and cuts across countries and sectors in order to increase external validity. It raises a '*how*' question, in order to analyse the processes and conditions explaining incremental innovation across institutional regimes. A scholar may also opt to limit him/herself to a study of a *'to what extent'* question, to one homogeneous sector, which increases internal validity at the expense of external validity, and/or to a specific region or set of countries.

I recommend applying the exploratory model developed in this thesis, treating institutional regimes as multilevel, multi-spatial and dynamic. However, the operationalisation of variables can be improved upon. In particular, the ergodicity, self-re-inforcement and irreversibility of historical paths can be modelled based on detailed time series over a sustained period of time. A subsequent comparison between case studies may allow for a statistical generalisation of the findings.

The recommended research strategy is a combination of literal and theoretical multiple case studies, enabling the study to assess if institutional regimes have internal coherence and external variety, and if these explain variation in the firms' innovation levels. If such a strategy is too time-consuming and/or expensive, the researcher may opt to choose between a literal or theoretical multiple case study strategy. Such a choice limits the research question and reduces the sample size.

The recommended study requires a sample size of up to 100 case studies and 10,000 firms. The proposed sample includes about 25 case studies within each institutional regime. A stratified sample allows the study to control for sectoral differences, income levels between territories and locational specificities. The sample size of each case study is approximately 100 firms, enables an assessment of the coherence within and variety between institutional regimes. In addition, a small sample of experts and firms is drawn for each case study in order to collect the qualitative data required for the fuzzy-set analysis and to map the processes

leading to innovation. Secondary information is collected on institutional regimes and incremental innovation within each case study.

The recommended data analysis methods are fuzzy-set analysis, co-variational analysis and qualitative analysis. If the study would not analyse processes leading to innovation, then no qualitative analysis is needed. Fuzzy-set analysis does not allow for the same rich descriptions and analysis of institutional regimes as other comparative qualitative analysis, but it is appropriate for an explanatory study (Fiss, 2007; Rihoux, 2013).

Besides the ambitious large scale study recommended above, the study recommends specific research questions and methodologies. These questions may be included in the above study, or they may be addressed in separate studies.

1) *How do evolving institutional regimes explain innovation in low-tech industries? A meta-analysis.*

   A low-cost way to test the relevance of the exploratory model is to conduct a meta-analysis of existing studies on incremental innovation in low-tech industries. However, such a research strategy has various drawbacks: the number of studies is limited (see table 1.1 in section 1.2); the sample is geographically biased to a few developed economies and China (see table 1.1); the sample is likely to be sectorally biased; the studies use different research questions, frameworks and methodologies; the studies will have incomplete data; and the studies may not be equally valid and reliable. As a result of these shortcomings, the validity and reliability of the meta-analysis is much lower than that of the large-scale explanatory research recommended above.

2) *What mechanisms explain incremental innovation in low-tech industries within institutional regimes?*

   The proposed study is qualitative in nature, and aims to deepen our understanding of the processes leading to innovation within institutional regimes. It may be conducted as a meta-analysis of existing studies, a single case study or a multiple case study. The study may also focus on a specific process, such as knowledge diffusion by technological gatekeepers, and question whether this process is conditioned by institutional regime.

3) *How do institutional regimes of low-cost mature industries evolve in processes of institutional path dependence and renewal?*

The evolutionary processes of low-tech industries are not well understood. Generally speaking, scholars assume that high-tech sectors replace low-tech sectors when the economy of a territory grows (Boschma and Frenken, 2007; Lall, 2003). This may be explained by institutional hysteresis in mature industries (Boschma and Frenken, 2006; Essletzbichler and Rigby, 2007; Geels, 2004). However, this study has illustrated that low-tech industries can renew themselves. UNCTAD (2010) furthermore shows that low technology sectors in the creative industry are increasing in size, also in emerging economies. This proposed study aims to understand how low-cost mature industries evolve. As discussed, the modelling of institutional path dependence can be improved upon and detailed time series over a sustained period of time can be collected. Such a study may be approached as a single case study or it may adopt a multiple case study strategy.

4) *How do innovation systems in emerging economies emerge and evolve?*

Innovation systems in emerging economies are gaining in strength. When local actors learn, innovation systems are expected to become stronger. However, development paths may also be destructed and innovation systems may weaken if industries downgrade. This study has explored the evolution of innovation systems in emerging economies, realising that their evolutionary patterns are still little understood. A mapping and analysis of evolutionary patterns of innovation systems within different institutional contexts can shed more light on the interplay of path dependence, destruction and renewal. Such an analysis may initially map the evolution of innovation systems across institutional regimes, sectors and territories and may subsequently analyse the processes leading to path dependence, destruction, renewal and creation. This may shed more light on how and why innovation systems change over time.

5) *How do technological and institutional path dependence co-evolve?*

Section 2.4.2 introduced two different types of path dependence: institutional and technological. The study has focused on institutional path dependence. A related question is whether institutional and technological path dependence adhere to the same principles and processes or not, and how they co-evolve. This question would require a

(multiple) case study in a sector where institutional and technological path dependence co-occur.

6) *Can path renewal be anticipated and/or created through strategic action?*

This research question considers the causes of path renewal, and in particular questions whether path renewal can be initiated intentionally. This question has a particular policy relevance. In Cape Town, for instance, it would be highly relevant to know how the segmentation of the innovation system can be broken down. In Yiwu, it would be relevant to explore how the innovation system can stimulate product innovation.

7) *How variegated are institutional regimes?*

All institutional regimes have variety, heterogeneity and ambiguity (Crouch, 2009; Hall and Thelen, 2009; Martin and Sunley, 2006). Understanding these aspects is important for two reasons. First, variegated institutional regimes send mixed signals to firms which makes it harder to predict innovation. Second, variety may indicate whether institutional regimes may be open to change or not. A study of variegated institutional regimes demands a comparative analysis between and within institutional regimes. The larger the number of countries studied, and the more sectors and territories studied within a country, the more robust the study findings become. Especially decentralised countries are likely to comprise heterogeneity and ambiguity.

8) *Do institutional regimes function as complex adaptive systems?*

This question moves beyond the exploratory model towards complexity theory (Martin and Sunley, 2007). It will be of particular relevance to identify how the role of institutions is influenced by their co-relations, their context and shocks. Sub-questions include whether fractals exist and whether institutional regimes function as self-organised systems. Issues related to the initial condition, non-linearity, non-determinism, butterfly effects and shocks are already partially ingrained in evolutionary approaches, but ought to be specified and adjusted.

8.8.2 POLICY RECOMMENDATIONS

It is risky to recommend policies based on an exploratory study, because the model is not yet fully tested. Nevertheless, five policy recommendations arise from the conclusions and findings, relevant for craft exporters in emerging economies. First, innovation policies, programmes and actors should be responsive to their specific institutional regime. After all, this study has proven that institutional regimes can differ between territories and that these differences can lead to different levels and types of innovation. Developing responsive innovation policies, programmes and actors in handicraft exports is therefore likely to require an understanding of specific institutional regimes. Sector specific applied studies may enable knowledge-based policy and programme interventions, relevant to the prevailing business and innovation system.

Second, I recommend that innovation policies of craft exporters in emerging economies pay special attention to global value chain support and firm competences. This entails enabling craft exporters to look for global buyers and negotiate with them, attend trade fairs, and improve their productive and innovative capabilities. The research results show that these measures are likely to increase the level of innovation across institutional regimes. Building up firm competences requires more than just education and training. The case studies show that an enabling business environment and export promotion may attract new firms, with highly educated entrepreneurs. New firms may in turn increase firm competences within a sector.

Third, and closely related to the above, my recommendation is for innovation policies of craft exports in emerging economies to look beyond the innovation system. The study results have illustrated that differences in business systems are likely to impact on innovation as well, and hence innovation policies may consider and even reconsider the mode of economic coordination prevalent within a region. In Yiwu, for instance, an increase in product innovation may arguably benefit from a transformation towards a joint economy. The research findings suggest that a larger role of government and intermediary organisations in economic coordination may enable more local networking, as is already evidenced in the Design Incubator. Such a transition should be carefully studied and demands close consultation of all actors. A challenge is that capacities are likely to be low among local actors in corporate and market economies, and therefore the initiation and management of transformations may be cumbersome (Griffiths and Zammuto, 2005).

Study results have illustrated that policies that are normally not connected to innovation may have an impact on innovation as well. For instance, the opening up

of export markets and the creation of a more enabling environment can attract new firms to a sector and hence drastically increase the level of innovation.

The fourth recommendation concerns path renewal in handicraft exports in emerging economies. The study findings and literature review illustrate that an institutional regime is likely to become more heterogeneous before a development path is renewed. When actors strategically want to initiate path renewal, I therefore recommend to carefully monitor the level of heterogeneity and variety within the institutional environment and arrangement. It is also recommended to assess if specific informal and formal institutions may hinder, slow down and/or steer path renewal. In Cape Town, for instance, the segmented social and physical networks, differences in educational opportunities and dysfunctional labour market are likely to hinder informal craft firms breaking through the barrier of segmentation (Adato *et al.*, 2006; Gradĭn Lago, 2013; Kruss *et al.*, 2010; Pieterse, 2010). In Yiwu, the risk-averse entrepreneurship of existing craft exporters, which can be traced down over centuries, may hamper or at least slow down path renewal (Mitussis, 2010; Qi, 2000). Policies and programmes can subsequently consider the various factors affecting or restraining change. However, strategic action to renew a development path ultimately remains unpredictable due to the unintended actions of many actors and the ambiguity of strategic action (Martin and Sunley, 2006 and 2007).

Finally, I recommend policy makers to consider if and how innovation policies, programmes and actors in support of craft exporters in emerging economies can become more adaptive to change. The research findings show that institutional regimes change, and rigid policies, programmes and actors may therefore outlive their usefulness, and over time become institutional rigidities (Boschma, 2009; Lambooy and Boschma, 2011; Martin, 2010). The study results have illustrated, however, that rules can be reinterpreted, enabling improvements in innovation outcomes. In Cape Town, for instance, an intermediary organisation (Cape Craft and Design Institute) integrates support policies for craft firms. Its services are highly adaptable, as it reinterprets rules and adjusts its programmes by involving crafters, a university and government in policy making and programming. In Yogyakarta, a similar institute hardly impacts on the level of innovation of firms, because it is unresponsive to their needs. It has been set up as a non-responsive government agency. And in Yiwu, a similar institute only caters for design firms attracted from outside the territory. Its local connections are weak, and hence the institute hardly contributes to the adaptability of the innovation system.

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ANNEX 1. SURVEY QUESTIONNAIRE

Researcher: Jan Fransen
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Research assistant: <name and address added>

The information that you provide is confidential and will be used solely for academic purposes. The questionnaire contributes to a PhD research that aims to assess how handicraft innovates. The study compares firms in Yogyakarta, Cape Town and Shanghai.

Name firm:_____ Date: _____

Contact address:_____ Email: _____

Comments and observations of interviewer:

Part 1. General information about the firm

1. How old is the firm? .....years

2. What is the main material that you use?

a)	Wood	e)	Wickerwork
b)	Ceramics/ pottery	f)	Leather
c)	Stones	g)	Silver
d)	Paperware/ plastic	h)	All

3. Do you combine different materials in one product?

a) Yes
b) No

4. What percentage do you export? .....%

5. When you export, do you use your own brand name, your client's or a combination?

a) Own brand
b) Client's brand
c) Combination

6. If you sell locally, do you sell in your own brand name, a client's brand name or a combination?

a) No local sales
b) Own brand
c) Client's brand
d) Combination

7. How many staff have you had on average the last 5 years? .....

8. About how much is your average turn over the past 5 years? .....

9. Do you export yourself or use a trader?

a) Self
b) Trader/ exporter

10. How many clients do you have?

a) 1
b) 2-10
c) 11-25
d) More

11. What percentage do you sell to your main client? ……%

12. Do you sometimes subcontract production?

a) Yes
b) No

12.2. If yes, about how many workers have been involved the past 5 years?

……..

12.3. Can I interview some subcontractors (if yes, follow up)? Yes/no

13. What is roughly your gross profit margin? ……%

14. Did you specialise in a small number of products or diversify to more products over time?

a) Not much change
b) Diversify
c) Specialise
d) Move to other products

15. Is the firm located in a cluster?

a) Yes
b) No

Part 2. Entrepreneur

16. Gender of entrepreneur

a) Male
b) Female
c) Partnership

17. What is your highest level of education?

a) Primary level not completed
b) Primary level completed
c) High school not completed
d) High school completed
e) Vocational school
f) Diploma (D3)
g) University

18. What is your age? ……

19. What was your previous position (what kind of job did you have before):

a) None
b) Other craft firm
c) Other

20. Do you or your staff speak foreign languages?

a) No
b) Yes

21. Do you travel abroad for work or pleasure?

a) Never
b) Just ones or twice
c) Every year
d) More often

22. Do you like to gamble or to take risks?

a) Yes
b) No
c) Only when I know the risks

Questions only for exporters and traders:

23. Do you have a marketing department?

a) Yes
b) No

23.2. If yes, what is the education level of the head marketing?

a) Up to primary level
b) Up to high school
c) Vocational education
d) Diploma (D3)
e) University

24. Do you have a production department?

a) Yes
b) No

24.2. If yes, what is the education level of the production manager?

a) Up to primary level
b) Up to high school
c) Vocational education
d) Diploma (D3)
e) University

25. Do you have a design department or designer?

a) Yes
b) No

25.2. If yes, what is the education level of the designer?

d) Up to primary level
e) Up to high school
f) Vocational education
g) Diploma (D3)
h) University

26. Who is the owner of the firm?

a) Myself
b) Myself and partners
c) Indonesian firm
d) Foreign firm

27. Can I have names and addresses of European clients? May I contact them?

Part 3. Level and type of innovation

28. How would you describe your firm?

a) Not innovative
b) Not very innovative
c) Neutral
d) Innovative
e) Very innovative

29. What do you innovate best?

a) Products
b) Production methods
c) Organisation
d) Marketing
e) Diversifying to new markets
f) Other: ...
g) All

30. Which statement is correct (choose one)

a) I make products of different materials or functions that are new to the world
b) I make products of different materials or functions that are new to Yogya
c) I adapt existing product designs (make small incremental changes to existing designs)
d) I mainly make designs given to me by clients

31. How important are new product designs for you?

a) Survival of the firm depends on it
b) Increase in income
c) Not so important

32. What is the percentage of repeat orders (same product for same client? .....%

33. What is the percentage sold to new clients? .....%

34. How often do you bring out new products and designs?

a) Weekly
b) Monthly
c) Quarterly
d) Annually

35. Have the number of buyers that you know increased over time?

a) No
b) A bit
c) A lot

36. Did you reduce costs in production, logistics or management?

a) No
b) A bit
c) A lot

37. Did quality of your products improve over time?

a) No
b) A bit
c) A lot

37.2. If yes, did it result in higher prices?

a) No
b) A bit
c) A lot

38. Have you become better able to deliver the right quality on time?

a) No
b) A bit
c) A lot

39. Has quality of your staff improved?

a) No
b) A bit
c) A lot

40. Has competition increased or decreased over time?

a) Decreased
b) No change
c) Increased

Part 4. How do you innovate within the firm (absorptive capacity)

41. What are the main constraints in innovating? (max three)

a) Know market trends and new technologies
b) Capacity of staff
c) Capacity of managers
d) Capacity of subcontractors/ communities
e) Access to finance
f) Designer cannot translate the concepts of me or my client
g) My own time
h) Other……

42. Did you attend training courses the past 5 years?

a) Yes
b) No

42.2. If yes, on what topics?

a) Product design
b) Marketing
c) Management
d) Technologies
e) Other

43. Did your staff attend training courses the past 5 years?

a) Yes
b) No

43.2 If yes, on what topics?

a) Product design
b) Marketing
c) Management
d) Technologies
e) Other

44. Do you borrow money to innovate?

a) Yes
b) No

45. Do you invest your own money to innovate?

a) Yes
b) No

46. Do you have a business plan?

a) No
b) Implicit
c) Yes

Part 5. Your network

47. Rank the importance of the following sources of new ideas on a scale from 1 to 7 *(1 is least important and 7 is the most important):*

Source	Rank (1-7)
✓ Global buyers and traders	
✓ Traders located in Jakarta	
✓ Traders and exporters in Yogyakarta	
✓ Trade fairs	
✓ Observing or talking to other local craft firms	
✓ Government of Indonesia (information on trade fairs, regulations, markets, training courses)	
✓ Chamber of Commerce	
✓ Asephi and Asmindo	
✓ Cluster associations	
✓ Universities and research institutes	
✓ Finance institutes (information on finance, risks and markets)	
✓ Internet	
✓ Periodicals, books, articles	

48. Do you regularly observe what other firms are doing in Yogyakarta?

a) No
b) Sometimes
c) As a routine

49. With whom do you discuss ideas for new designs, clients or markets?

a) My staff
b) Global buyers or traders
c) Other craft firms
d) Government
e) Universities
f) Association
g) Friends and family
h) Others: .....
i) None

50. What do you try to keep secret from competitors?

a) Nothing
b) Designs
c) Clients
d) Price
e) Other: .....

51. What statements are true for the relationship with your most important buyers

Statement	True/ False
My client normally gives me the design that I should make *If false: my client normally gives me a design idea which I try to make*	True / False True / False
My main clients give me raw materials	True / False
My main clients give me equipment	True / False
My main clients know exactly how much profit I make	True / False
I am only paid afterwards	True / False
My client often visits me to check quality	True / False
My main client trusts me and I trust him/her	True / False

52. Do other firms copy your ideas?

a) Yes
b) No

53. How do you protect your ideas? (can be many answers)

a) I do not, I quickly make new designs
b) I try to keep designs secret
c) I only work with people I trust (staff, family, friends, subcontractors)
d) I make complex products, difficult to imitate
e) I apply for patents
f) Other: .....

If I have any more questions, can I email or call you? .....

End. Thank you!

ANNEX 2. CHECKLIST SEMI-STRUCTURED INTERVIEWS

Part 1: trends

1. Trends in innovation: past decades, past 5 years, coming years
2. Key market segments and their trends
3. Changes in turn-over and profit
4. Main competitors
5. Upgrading the past 10 years in comparison to competitors

Part 2: business systems

6. Export dependence
7. Industrial policies, programmes and regulations
8. Financial sector
9. Industrial networking
10. Perceived reliability of formal institutions

Part 3: innovation

6. Available technology and technology gap
7. Kind and level of innovation? Product, process, markets, diversify
8. Benefits of innovation
9. Constraints
10. Best practices

Part 4: absorptive capacity/ competences

11. Source of knowledge
12. Ability to acquire, assimilate, transform and exploit
13. Investments and risks
14. Education and training
15. Employer-employee relationship
16. Differences between small and large firms, entrepreneurs, gender, ..
17. R&D

Part 5: local innovation system

18. Clustering
19. Policies on crafts, SME, education and innovation
20. LIS actors and their competences
21. Knowledege exchange among actors

22. Trust and social embedding: families, kinships, friendship
23. Level of decentralisation
24. IPR: problematic, rules, firm strategies

Part 6: structure of and position in global value chain

25. Key international regulations and standards (ISO9000; ISP14000; SA8000 labour)
26. International quotas and import restrictions?
27. Governance of global value chains
28. Roles and structure
29. Key buyers and their strategies
30. Innovation and learning from buyers
31. Trade fairs
32. Territorial competitiveness

Part 7: documents

- Database of firms
- Annual report
- Statistics
- Studies: market, value chain, upgrading
- Key periodicals

ANNEX 3. DESCRIPTIVE STATISTICS (MAIN SURVEY RESULTS)

Table A1. Descriptive statistics

	Mean/ median	Min	Max.	SD	Case study		
					Yogya-karta	Cape Town	Yiwu
INNOVATION							
Perceived innovation level	3.78/4	1	5	0.857	3.6_a	4.4_b	3.5_a
Perceived newness of product	2.09/2	1	4	1.080	2.1_a	3.0_b	1.5_c
Process innovation (dummy)	0.24/0	0	1	0.428	0.26*	0.05*	0.36*
INNOVATION RENTS							
Increase quality products	3.88/4	1	5	0.070	3.6_a	4.3_b	3.8_a
Increase number of buyers	3.14/3	1	5	1.263	2.9_a	3.2_{ab}	3.4_b
Better able to deliver on time	3.10/3	1	5	1.929	3.5_a	2.3_b	3.3_a
Cost reduction	2.08/2	1	5	1.158	2.7_a	1.5_b	2.0_c
LOCAL INNOVATION SYSTEM							
Interactions with local buyers	3.29/3	1	5	1.427	--	4.062_a	$2,710_b$
"" local traders	3.02/3	1	5	1.563	3.010	--	--
"" local firms	2.56/3	1	5	1.310	2.629_a	1.971_b	2.870_a
"" business ass	2.06/2	1	5	1.243	1.917_a	2.361_b	1.962_{ab}
"" government	1.97/1	1	5	1.180	2.194_a	1.745_b	1.944_{ab}
"" finance inst.	1.72/1	1	5	1.160	2.215_a	1.132_b	1.753_c
"" CoC[3]	1.58/1	1	5	1.005	1.562_a	1.183_b	1.914_c
"" universities	1.49/1	1	5	0.873	1.619_a	1.289_b	1.542_{ab}
Importance observations	3.20/3	1	5	2.212	2.957_a	3.111_a	3.472_a
Located in cluster dummy	0.36/0	0	1	0.480	0.410	0.256	0.385
Copying of products dummy	0.76/1	0	1	0.426	0.815	0.704	0.775
GLOBAL VALUE CHAIN							
Interactions with global buyer	3.76/4	1	5	1.402	3.418_a	3.282_a	4.362_b
Interactions at trade fairs	3.25/4	1	5	1.460	3.041_a	3.096_{ab}	3.551_b
Trust in global buyer	4.52/5	1	5	0.753	4.603_a	4.580_a	4.392_a
Role: trader (dummy)=1[1]	0.19/0	0	1	0.393*	0.310*	0.072*	0.153*
Captive global value chain=1[2]	0.14/0	0	1	0.349	0.151	0.151	0.126
Use buyers' design	3.16/3	1	5	1,396	3.244_a	2.346_b	3.705_c
Use buyers' design ideas	2.72/3	1	5	1.214	2.774	2.654	--
Use buyers' material	1.44/1	1	5	1.004	1.602	1.420	1.321
Use buyers' equipment	1.23/1	1	5	0.742	1.142	1.395	1.194
Buyer knows our profit	2.13/2	1	5	1.737	2.113_a	$1,383_b$	2.717_c
Buyer pays afterwards	2.74/3	1	5	1.191	3.082_a	2.903_a	2.281_b

Continued	Mean/ median	Min	Max.	SD	Case study		
					Yogya-karta	Cape Town	Yiwu
Buyer checks quality	2.96/3	1	5	1.469	3.585_a	1.764_b	3.245_a
% sales to main client	37.5/30	1	100	24.100	47.3_a	37.0_b	30.8_b
Number of clients							
1	4.4	1	100		5.0*	9.8*	0.0*
2-10	28.7	1	100		62.0*	13.4*	10.5*
11-25	20.6	1	100		25.0*	11.0*	23.7*
Above 25	46.3	1	100		8.0*	65.9*	65.8*
FIRMS: STRATEGIES							
Own brand in export dummy	0.58/1	0	1	1.004	0.351*	0.771*	0.466*
Own brand locally dummy	0.51/1	0	1	0.501	0.242*	0.921*	0.447*
Copyright protection							
Protective measures	0.71/0	0	1	0.454	0.475*	0.671*	0.947*
Keep design secret	0.48/0	0	1	0.501	0.414*	0.183*	0.761*
Keep client secret	0.34/0	0	1	0.474	0.313*	0.037*	0.580*
Keep price secret	0.34/0	0	1	0.476	0.293*	0.024*	0.625*
Keep technology secret	0.34/0	0	1	0.475	0.202*	0.171*	0.589*
Work with trustees	0.27/0	0	1	0.442	0.455*	0.110*	0.212*
Speed up innovation	0.23/0	0	1	0.425	0.404*	0.110*	0.177*
Patenting	0.20/0	0	1	0.403	0.030*	0.000*	0.496*
More complex designs	0.18/0	0	1	0.382	0.253*	0.183*	0.106*
FIRMS: ABSORPTIVE CAPACITY							
Education entrepreneur							
Primary	12	1	100		0.180*	0.132*	0.059*
Secondary	25	1	100		0.190*	0.181*	0.347*
Vocational	3.7	1	100		0.100*	0.012*	0.000*
Higher education (dummy)	59.5	1	100	0.492	0.530	0.675	0.593
Frequent international travel dummy	0.55/1	0	1	0.498	0.530*	0.778*	0.411*
Language abilities dummy	0.77/1	0	1	0.423	0.540*	0.964*	0.824*
Previous experience dummy	0.75/1	0	1	0.432	0.742	0.744	0.770
“” in craft firm dummy	0.39/0	0	1	0.489	0.351	0.397	0.425
Entrepreneur training 5 years dummy	0.61/1	0	1	0.488	0.545*	0.566*	0.712*
Staff training 5 years dummy	0.51/1	0	1	0.501	0.404*	0.317*	0.737*
Discuss with staff dummy	0.67/1	0	1	0.472	0.660*	0.524*	0.774*
More than 1 department	0.49/0	0	1	0.465	0.426*	0.159*	0.814*
Borrow from banks dummy	0.40/0	0	1	0.491	0.505*	0.185*	0.464*
Invest in innovations dummy	0.68/1	0	1	0.469	0.790*	0.827*	0.462*
Has a business plan	0.68/1	0	1	0.469	0.590*	0.646*	0.781*
Able to balance innovations	0.19/0	0	1	0.393	0.192	0.241	0.153

Continued	Mean/ median	Min	Max.	SD	Case study		
					Yogya-karta	Cape Town	Yiwu
CONTROL VARIABLES: FIRM							
Age	12.6/11	1	59	7.959	13.2_{a}	10.8_{a}	13.5_{a}
Staff number	142/21	1	15000	908.5	36.9_{ab}	12.6_{a}	323.7_{b}
Annual turnover (US$)	17mln/ 200,000	350	1.6 bln	109 mln	$361,969_{a}$	$195,883_{a}$	$45mln_{b}$
Owner: local entrepreneur	0.85/1	0	1	0.353	0.897*	0.976*	0.730
Product segments							
Paper/plastic	18.2	1	100		0.060*	0.133*	0.319*
Combined materials	17.9	1	100		0.190*	0.145*	0.193*
Woodworks	17.9	1	100		0.200*	0.120*	0.202*
Pottery	13.6	1	100		0.190*	0.181*	0.059*
Silver/metal	12.6	1	100		0.090*	0.301*	0.034*
Leather	8.3	1	100		0.040*	0.096*	0.109*
Wickerwork	7.6	1	100		0.130*	0.012*	0.076*
Stone	3.6	1	100		0.100*	0.012*	0.000*
CONTROL VARIABLES:							
Entrepreneur							
Age	43.3/42	20	96	10.203	40.3_{a}	45.2_{b}	44.9_{b}
Gender: male dummy	0.78/1	0	1	0.413	0.819*	0.542*	0.924*
Risk taking propensity	3.29/3	1	5	1.130	3.41_{a}	3.72_{a}	2.85_{b}
Other							
Importance of Internet	3.656/4	1	5	1.389	3.653_{a}	3.561_{a}	3.733_{a}
Importance of documents	2.706/3	1	5	1.386	2.433_{a}	3.037_{b}	2.703_{ab}

*Significant differences between case studies at p< .05 in Pearson Chi-Square test.

$_{abc}$ Values in the same row not sharing the same subscript are significantly different at p< .05 in the two-sided test of equality for column means. Tests assume equal variances.

[1] The main role of a trader is trading, but the firm may also produce part of its products itself.

[2] Captivity is measured as over 70% dependent on orders of one client

[3] CoC is Chambers of Commerce

ANNEX 4. TECHNICAL NOTE ON THE FACTOR ANALYSIS OF YOGYAKARTA

The factor analysis aggregates indicators of the independent variables and the mediator into composite variables. As my models include variables that are dichotomous or ordinal, factor analyses are performed by using polychoric correlation matrices in Stata 13. The factors are categorical indicators. The factor global value chains is constructed from the perceive importance of knowledge from global buyers, the mode of governance and the roles in global value chains (table A2). Its Kaiser-Meyer-Olkin (KMO) factor is sufficient at 0.6443, but the Chronbach Alpha coeffient is low at 0.4351. Reasons behind the low score are that the factor includes categorical and dummy variables and the sample size is small.

Table A2 Factor Global Value Chain

Factor Global Value Chain	N	Frequency
1	18	18.37
2	44	44.90
3	36	36.73
Total	98	100.00

The factor local innovation system is constructed from the following indicators: perceived importance of knowledge exchange with government, local buyers, local suppliers, cluster associations, finance institutes, chamber of commerce and universities, location in a cluster, copying and observations (table A3). Its KMO factor is sufficient at 0.6125 and the Chronbach Alpha is sufficient at 0.6443.

Table A3 Factor Local Innovation System

Factor Local Innovation System	N	Frequency
1	36	36.73
2	40	40.82
3	12	12.24
4	6	6.12
5	4	4.08
Total	98	100.00

The factor absorptive capacity is constructed from the following indicators: frequency of international travel; language abilities; previous position; training; internal communication; number of departments; staff capacity; participation in decision making; investments; financing of innovations; business plans; and balancing innovations (table A4). Its KMO factor is sufficient at 0.6550 and its Chronbach Alpha coefficient is sufficient at 0.6125.

Table A4 Factor Absorptive Capacity

Factor Absorptive Capacity	N	Frequency
1	34	37.36
2	23	25.27
3	34	37.36
Total	91	100.00

ANNEX 5. TECHNICAL NOTE ON THE MARGINAL EFFECTS IN YOGYAKARTA

This technical note reports on all the marginal effects for the four Ordered Probit Regression Models presented in table 4.5. The note offers a more elaborate reporting and shows that (1) the marginal effects as reported in table 5 are among the highest; and (2) when table 5 reports a significant marginal effect, this tends to be true for the other categories as well.

Table A5 Marginal effects in model a[1]

Innovation Categories	Global value chain	Local innovation system	Patents	Firm age
1. Very low	-0.0115	-0.00334	-0.0428	0.000743
	(0.0102)	(0.00486)	(0.0418)	(0.000677)
2. Low	-0.0518**	-0.0151	-0.194*	0.00336*
	(0.0264)	(0.0158)	(0.109)	(0.00178)
3. Medium	-0.0836**	-0.0244	-0.313**	0.00543*
	(0.0368)	(0.0252)	(0.154)	(0.00280)
4. High	0.0605**	0.0177	0.226*	-0.00393**
	(0.0266)	(0.0190)	(0.131)	(0.00177)
5. Very high	0.0864**	0.0252	0.323**	-0.00560*
	(0.0397)	(0.0258)	(0.149)	(0.00302)
Observations	94	94	94	94

[1] Regression of innovation on the global value chains and local innovation system
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A6 Marginal effects in model b[1]

Innovation categories	Absorptive capacity	Global value chain	Local innovation system	Patents	Firm age
1. Very low	-0.0158	-0.00443	-0.00124	-0.0367	0.00116
	(0.0145)	(0.00617)	(0.00412)	(0.0361)	(0.000951)
2. Low	-0.0673***	-0.0189	-0.00528	-0.157	0.00496***
	(0.0252)	(0.0255)	(0.0162)	(0.0997)	(0.00185)
3. Medium	-0.0930***	-0.0261	-0.00730	-0.216*	0.00685***
	(0.0252)	(0.0344)	(0.0225)	(0.130)	(0.00264)
4. High	0.0755***	0.0212	0.00592	0.176	-0.00556***
	(0.0247)	(0.0275)	(0.0183)	(0.116)	(0.00170)
5. Very high	0.101***	0.0283	0.00789	0.234*	-0.00741***
	(0.0297)	(0.0372)	(0.0244)	(0.128)	(0.00275)
Observations	87	87	87	87	87

[1] Regression of innovation on global value chains, the local innovation system and absorptive capacity.
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A7 Marginal effects in model c[1]

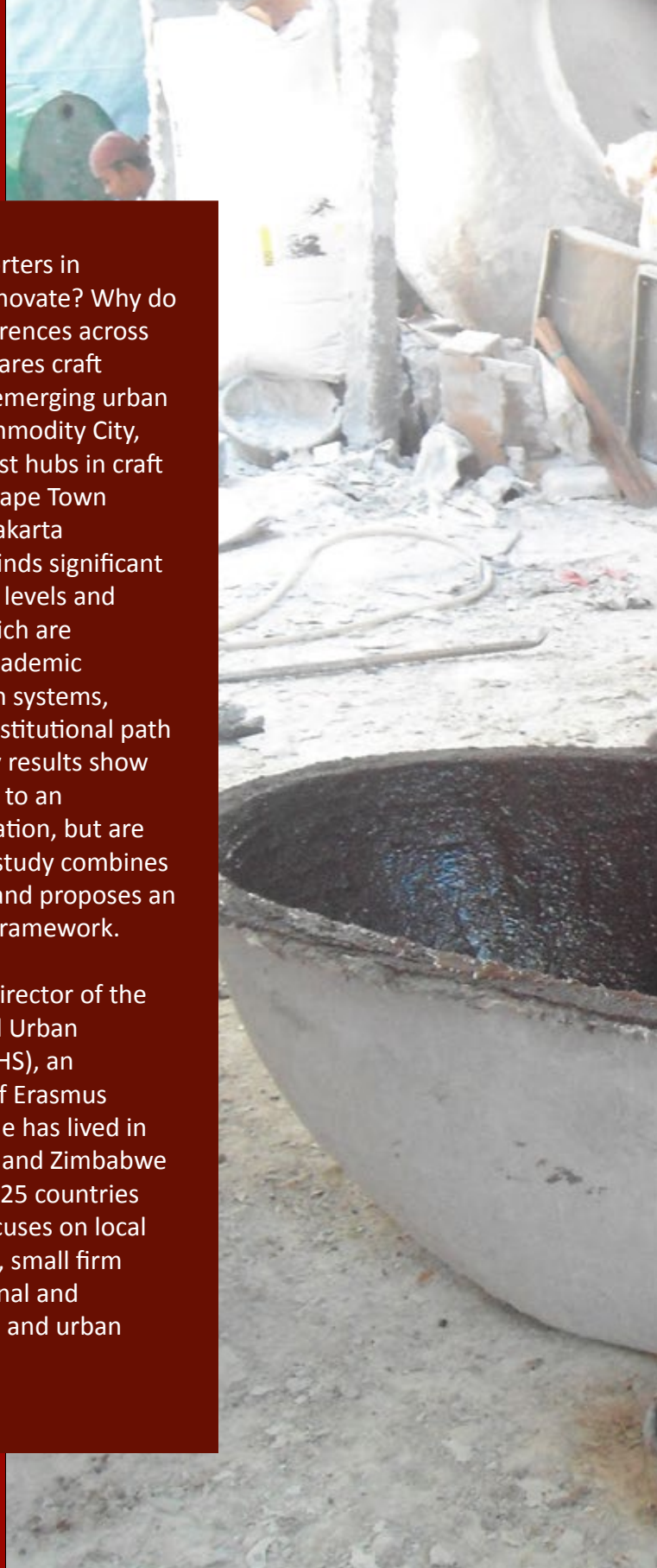
Absorptive capacity categories[2]	Global value chain	Local innovation system	Patents	Age of firm
1	-0.281***	-0.0424	-1.600***	-0.00553
	(0.0387)	(0.0346)	(0.150)	(0.00455)
2	0.0114	0.00172	0.0649	0.000224
	(0.0177)	(0.00328)	(0.106)	(0.000411)
3	0.269***	0.0407	1.535***	0.00530
	(0.0432)	(0.0328)	(0.106)	(0.00435)
Observations	88	88	88	88

1 Regression of absorptive capacity on global value chains and the local innovation system
2 The categories are described in the main document, section 'Research Methods'.
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A8 Marginal effects in model d[1]

Innovation Categories	Absorptive capacity	Patents	Firm age
1. Very low	-0.0183	-0.0364	0.00117
	(0.0162)	(0.0351)	(0.000943)
2. Low	-0.0782***	-0.156	0.00499***
	(0.0268)	(0.0978)	(0.00184)
3. Medium	-0.108***	-0.214*	0.00686***
	(0.0235)	(0.126)	(0.00265)
4. High	0.0881***	0.175	-0.00562***
	(0.0241)	(0.114)	(0.00171)
5. Very high	0.116***	0.231*	-0.00739***
	(0.0283)	(0.123)	(0.00269)
Observations	87	87	87

[1] Regression of innovation on absorptive capacity
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1



How do handicraft exporters in emerging economies innovate? Why do we find innovation differences across space? This study compares craft exporters across three emerging urban economies: China's Commodity City, one of the world's largest hubs in craft production and trade, Cape Town (South Africa) and Yogyakarta (Indonesia). The study finds significant differences in the firms' levels and types of innovation, which are explained from three academic perspectives: innovation systems, business systems and institutional path dependence. The study results show that all perspectives aid to an understanding of innovation, but are underdetermined. The study combines the three perspectives and proposes an integrated exploratory framework.

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See: www.ihs.nl