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Jan Fransen

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Lock-in and New Path Development of China Commodity City: The Role of Policies

Jan Fransen

Institute of Housing and Urban development Studies (IHS), Erasmus University Rotterdam, Rotterdam, The Netherlands

ABSTRACT

China Commodity City (Yiwu) has evolved from a poor, isolated region into one of the world largest mass-producers of low-tech products. This study applies the concept of path dependence in order to trace Yiwu's industrial development trajectory. It zooms in on factors leading towards lock in, path extension and path creation. The study identifies multiple factors leading towards a lock-in and possible path decay. At the same time, related diversification and industrial policies such as the China Belt and Road Initiative enable path extension. New path creation is however less likely in the nearby future. While China moves towards a knowledge economy, innovation policies in Yiwu have not yet been successful, as they don't specifically target low-tech family firms, implementation capacity is limited, instruments are not well targeted and institutional incentives are diffuse. To create an alternative innovation-driven industrial pathway, the study recommends landscape pressure and multilevel experimentation.

KEYWORDS Path dependence; innovation policies; industrial policies; Yiwu; China

1. Introduction

Economic path dependence is often portrayed as an institutional and deterministic process, which explains how a region's industrial structure locks-in and decays over time (Mahoney, 2000; Martin & Sunley, 2006). However, this canonical perspective of path dependence fails to explain why most old industrial regions sprout new industries and services. Martin (2010) reconceptualizes path dependence arguing that it also explains industrial path development. Trippel et al. (2018, p. 687) identify two main trajectories of path development¹: incremental processes leading to the renewal of regional industries and radical processes leading to the creation of new ones. We refer to the first as *path extension*, because incremental innovations and diversification to related industrial sectors enable regional industries to continue within its existing or related knowledge, skillset and institutions (Grillitsch et al., 2018; Neffke et al., 2011). In a low-tech industrial region such as Yiwu, this entails that firms diversify to related products and markets but remain competitive in mass production, or what Malecki (2004) refers to as the low road of competitiveness. Occasionally, *path creation* takes place when exogenous stimuli enable a region to

¹Grillitsch et al. (2018) identify more forms of path development, using a slightly different terminology.

sprout completely new industries in unrelated sectors based on new (combinations of) knowledge, skills and institutions (Grillitsch et al., 2018). In a low-tech industrial region such as Yiwu, this entails the introduction of innovation-driven industries or services, or what Malecki (2004) refers to as the high road of regional competitiveness.

A new and promising strand of research has emerged to assess the 'opportunity space' (Grillitsch et al., 2018) for industrial path development (Geels, 2004; Geels & Schot, 2007; Grillitsch & Asheim, 2018; Isaksen et al., 2018; Martin, 2010; Martin & Simmie, 2008; Martin & Sunley, 2006; Neffke et al., 2011; Trippl et al., 2018). Simandan (2012, p. 173) ranks this 'reconceptualization of regional path dependence as the single most important contribution to evolutionary economic geography of the last decade'.

This study contributes to the academic debate by analysing the evolution of low-tech industries in China Commodity City (Yiwu). The world's largest low-tech manufacturing and wholesale hub was a poor, isolated village until the 1980s. From then onwards, it emerged as a production and trading hub and a success story in alleviating poverty, economic growth and employment creation (Si et al., 2015). However, this rosy picture is changing: the past decade costs and competition have increased, while profit margins decrease. It seems that the regional industry moves towards a lock-in, setting another frightening example of the canonical path dependence model. However, the study results show that the institutional structure offers incentives for path development as well. This raises the following research question: *How does path dependence create opportunity space for path extension and creation of Yiwu's low-tech industry?* We identify three sub-questions: (1) To what extent is Yiwu's industrial pathway locked into the low road of competitiveness?; (2) What is the opportunity space for path extension and creation?; and (3) Does the opportunity space emerge and evolve in path dependent processes?

We are especially interested in the role of policies in regional industrial path development of old industrial areas. Neffke et al. (2011) attaches limited relevance to industrial policies, arguing that processes of industrial branching are primarily self-organised. By contrast, other scholars argue for pro-active policies in order to reduce the risks of path decay (Isaksen et al., 2018; Grillitsch & Asheim, 2018). A fourth sub question is therefore: *What is the role of policies in creating Yiwu's opportunity space?*

The study offers two contributions to the emerging body of literature. First, we offer an empirical study on the opportunity space as a relative measure of regional lock-in and path development. Concretely, we identify multilevel factors potentially leading to lock in, path extension and path creation. Second, we discuss the role of industrial and innovation policies in economic change. We apply a case study approach in order to trace the long-term non-linear and non-deterministic evolution of Yiwu's complex institutional structure.

The paper is structured as follows. The theory section contrasts theory on economic path dependence as a historical process leading to lock-in with that of path extension and creation, culminating in a conceptual framework. This is followed by a description of research methods, Yiwu's story, an analysis of the various pathways and the role of policies therein. The last section concludes and offers recommendations.

2. Theory

This section identifies factors leading to varying degrees of lock-in, path extension and path creation within evolving regional industrial structures in old industrial areas. North (1991) defines a regional industrial structure as an interdependent and complex web of formal and informal institutions, intertwined with political and spatial structures, resources and capacities, which influence regional industrial development trajectories. Institutions are defined as the humanly devised constraints that structure economic interaction (North (1991: 97)).

2.1. Lock-in

Arthur's (1989, 1994) model of increasing returns argues that once an industrial specialisation emerges, positive feedback mechanisms lead to increasing returns, while the cost of switching to another regional specialisation increases. These emerging industrial structures are not always efficient. To the contrary: they are determined by historical decisions of actors with bounded rationality, opportunism and limited information. Regional industries can therefore be locked into inferior development paths even if more efficient alternatives exist (Martin & Sunley, 2006).

Arthur (1989) breaks down path dependence into four factors. First, the *sequencing* of events starts with historical small events that happen at the right moment of time. These minor events subsequently intersect, thereby producing a major event, leading to the emergence of industrial structures (David, 2000). Second, this process is expected to have *contingency*, which entails that its earlier phase is stochastic. Third, the process has *non-ergodicity*: the inability to shake free of history (Martin & Sunley, 2006). Different types of industrial structures may thus emerge out of stochastic events but become locally irreversible over time.

The emerging industrial structures subsequently become *inflexible*, the fourth element and obtain a certain hardness due to compatibility standards and sunk costs (Geels, 2004; Geels and Schot, 2007). Localization economies, such as efficient matching of labour to jobs and the sharing of urban infrastructure and services, lead to advantages of scale of specialised industries (Martin & Sunley, 2006). Industrial policies reinforce these processes of specialisation in a drive to maximise short-term economic growth. Global value chains also play their part, as global buyers profit from regional increasing returns. Dependency on global buyers subsequently skews learning and adapts expectations of local firms towards mass-production. Dependence on market knowledge of global buyers incentivizes individual bargaining in global value chains instead of local networking (Fransen & Knorringa, 2019; Gereffi et al., 2005; North, 1991). At the same time, the cost of switching to other industrial sectors increases due to sunk costs and the cost of unlearning working practices (Geels & Schot, 2007). In the absence of knowledge networks, information costs of innovative alternatives are high and hard to calculate. Risks of moving towards innovative alternatives can't easily be shared in networks and are therefore perceived as risky (North, 1991). The industrial structure becomes locked-in. A development path subsequently decays, because local industries have become unable to respond to changes in demand, shocks and disturbances (Martin & Simmie, 2008).

2.2. Path Extension

The above canonical perspective of path dependence is problematic because most regional industrial structures renew themselves. Path decay is relatively rare (Martin & Sunley, 2006). We separate path extension, which maintains business as usual, and path creation, which requires a switch from the low to the high road of competitiveness.

Arthur's model anticipates that increased efficiency may lead to path extension (Isaksen, 2015), but ignores that the process leads to related variety. When local firms deepen their skills (Fransen & Knorringa, 2019), they develop capacity to expand to related industries. In addition, regional advantages of scale attract Foreign Direct Investments (FDI) in related industries (Neffke et al., 2011). Regions also import institutions from abroad, such as R&D centres, IPR institutions, business incubators and city branding, leading to institutional variety (Trippel et al., 2018; Isaksen et al., 2018). Institutions may also evolve (North, 1991). A caveat is that regions require considerable absorptive capacities and learning networks to acquire and adjust external knowledge. These capacities depend foremost on the maturity of the regional innovation systems (Fransen & Helmsing, 2017).

Path extensions reduce the risk of path decay by diversifying to related institutions, markets, products and technologies. Industrial policies reinforce diversification by deepening capacities, addressing market inefficiencies, increasing localization economies and attracting FDI. They may however also mask market failure, allowing obsolete industries to remain afloat a bit longer (Isaksen, 2015).

2.3. Path Creation

Path creation entails the emergence of unrelated industries, institutions, markets and technologies within a region. It is relatively rare and generally associated with distinct moments of industrial upgrading (Fransen & Knorringa, 2019). The question is if and how policies in old industrial areas create alternative trajectories towards the high road of competitiveness. This policy quest has become pressing, because old industrial areas and peripheral regions want to upgrade their industry and polluted regions want to green their industry. In contrast to path extension, path creation demands new webs of institutions, functions, skills and technologies (Isaksen et al., 2018).

Grillitsch et al. (2018) argue that path creation requires exogenous stimuli and networks. We structure exogenous influences at two levels: the landscape and niche (Geels & Schot, 2007). The landscape level comprises macro-economic trends, changes in global value chains and broader and/or national politics, policies and cultures. Landscape trends shift selection pressures and thereby the behaviour of firms over long periods of time (Geels & Schot, 2007). They include changes in consumer behaviour, perceptions of mass production and pollution, availability of resources and (inter)national policy changes. While policies may play a role in changing landscape trends, changes in informal institutions are more difficult to achieve. Institutional niches form the micro-level and protect innovators from mainstream market selection and institutional rigidity (Geels & Schot, 2007). They may take the form of business incubators or accelerators. If successful, experiments in technologies or ways of working may be upscaled to the mainstream industrial structure. However, such experiments are fundamentally uncertain, risky and hard to upscale.

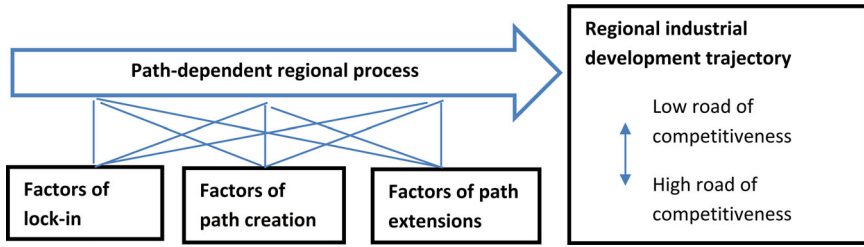


Figure 1. Long term path dependent development trajectories.

To be successful, they should be coordinated and capacitated, while allowing for flexibility, reflection and learning (Isaksen et al., 2018; Trippel et al., 2018).

Endogenous dynamics and exogenous stimuli constantly and eclectically intertwine, leading to a dynamic interplay between lock-in, path extension and path creation. A caveat is that most old industrial areas lack the diversity, knowledge, skills, institutions and support organisations to enable path creation (North, 1991). Their lock-in is functional, political and cognitive (Grabher, 1993).

2.4. Conceptual Framework

Figure 1 conceptualises the path dependent processes of regional industrial development. Potential development trajectories of an old industrial area lie in between the low and high road of competitiveness but are likely to be close to the low road. Path dependent is influenced by factors of a lock-in, path extension and/or path creation. Table 1 lists factors within and outside the regional industrial structure, as path creation and to a lesser extend path extension are likely to demand external knowledge and investment. While industrial policies are likely to lead to path extension in old industrial areas, innovation policies may lead to path creation. However, the impact of factors, including policies, is nonlinear and place and time specific, as they interact with the complex and evolving web of interrelated institutions forming a regional industrial structure.

3. Methods

This study is approached as a single case study. China Commodity City, or Yiwu, is located at 280 km from Shanghai in Zhejiang. It has a population of about 800,000 people plus approximately 1.2 million job migrants. With its deep specialisation and exponential economic growth, it offers a unique case study of an old industrial area. Mahoney (2000) recommends process tracing in order to sequence events and their preconditions. He sequences events as initial, critical and self-reinforcing. Process tracing aims to make inferences about the most convincing process explanation of the relative lock-in of the contemporary industrial structure.

The dependent variable is Yiwu's long term regional industrial development trajectory, whereby we assess to what extent it evolves purely as a mass production industry or also includes alternative trajectories of an innovation-driven economy at certain moments of time. Mass producing industries, as opposed to a knowledge economy, tend to have lower margins, invest and innovate less and depend more on knowledge and markets of global buyers. (Table 1). We trace the path

Table 1: Variables.

Variables	Sub-variables
DEPENDENT	
Regional industrial development trajectory	High road of competitiveness Low road of competitiveness
INDEPENDENT	
Process factors	Contingency Sequencing Local irreversibility Non-ergodicity Inflexibilities
Factors of lock-in	Specialisation Sunk costs Locational economies Dependence on global buyers Adapted expectations Skewed capacity
Factors of path extension	Training and learning Industrial policies Deepened skills and productivity
Factors of path creation	Branching Knowledge networking Trust Innovation policies Innovation capital Landscape changes Institutional niches

Source: Author.

dependentevolution based on Arthur’s model of increasing returns, considering its contingency non-ergodicity, sequencing of events and inflexibilities (Table 1). We identify a range of factors which push the development trajectory towards a lock-in, path extension and/or path creation, whereby we pay special attention to industrial and innovation policies at national, regional and local level.

In order to trace the historical process, we use secondary sources and qualitative data collected in 19 interviews with firm and non-firm actors (experts, local governments, chambers of commerce, business associations). Interviews are open, using checklists based on the identified (sub)variables. Triangulation of secondary and primary data increases validity. In order to describe the contemporary industrial structure (i.e. to what extent it is mass producing or includes innovative alternative pathways), we also have access to a survey of 118 randomly selected firms, which maps firm characteristics, levels of innovation and diversification, and the firms’ networks. For this study, this statistical data is only used descriptively.

Qualitative analysis in Atlas-ti sequences events, describes and groups the independent and dependent variables and analyses their relationships. Sequencing aims to appreciate the temporality and thereby assess the likely effect of factors, including policies, on the development trajectory of Yiwu’s industry. The narrative sequencing of events aims to do justice to the nonlinearity and complexity of the evolving institutional structure.

4. Findings

This section describes Yiwu’s evolutionary process and then analyses the findings. In between brackets, the text refers to Figure 2.

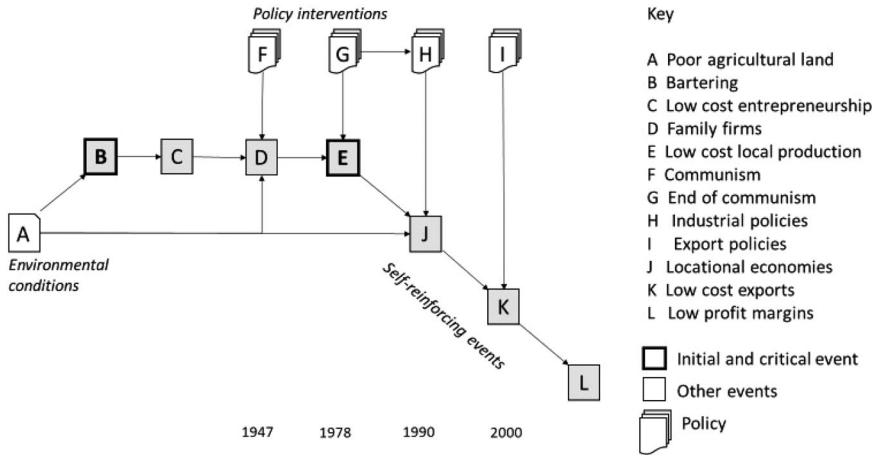


Figure 2. Sequencing of events in Yiwu.

4.1. Timeline

4.1.1. Initial Events

Yiwu has been a poor, relatively isolated rural area with poor farming conditions from its established around 222 before Christ (Figure 2A). People picked up their shoulder poles and travelled great distances in order to barter locally produced brown sugar (Figure 2B; Qi, 2000). Informal family firms worked hard at low profit margins (Figure 2C). Bartering resulted in long term trusted trading relationships all over China (guanxi networks). As the government-controlled resources and travel routes, their relationship with government was patriarchal and fraud with mistrust (respondent 129; Mitussis, 2010).

When the Chinese central government introduced a centrally planned economy, bartering was banned (Figure 2F). However, Yiwu's local government started offering a limited amount of trading licenses in 1963, under the pretext that feathers were important for compost (Ding, 2009). This local exception was made possible by decentralisation, Yiwu's relative isolation and liberal policies within Zhejiang province (GaoHua, 2000; Qi, 2000; Si et al., 2015). Yiwu's impoverished families were eager to accept the limited opportunity to barter and established two small markets in its support (Figure 2D; Jacobs, 2010).

4.1.2. Critical Juncture (Figure 2E)

From 1978 onwards, the communist party incrementally lifted the ban on private firms and trade, thereby initiating a transition towards a market economy (Figure 2G). However, trade was still formally forbidden in the early years. Nobody knew what was allowed and what not (Jacobs, 2010). At the same time, demand surged due to massive shortages of low-cost necessities. In this institutional void, the Zhejiang model of development emerged, within which thousands of family firms and small trading firms spontaneously popped up and clustered in villages (Bellandi & Lombardi, 2012). The age-old bartering ties of Yiwu's peddlers offered trusted networks needed to re-establish trade (Ding, 2009). Yiwu's family firms rapidly upscaled production and trade despite the absence of regulations, limited resources and poor

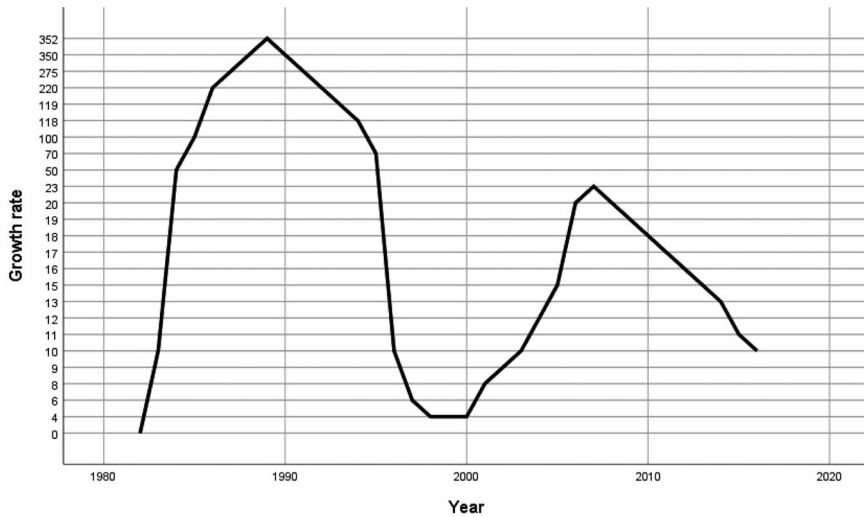


Figure 3. Estimated growth of turnover.

Sources: Ding, 2009; www.yiwu.international.com (various years).

technologies (Jacobs, 2010). The reputation of Yiwu as a centre of trade was boosted by a new commodity-market, which was established by the informal business association 'Zhejiang China Small Commodities City Group' in 1982 (Belguidoum & Pliez, 2015). The local government, which was also unclear on national policy directions, took a calculated risk by permitting Yiwu's peasants to engage in commerce, logistics, competition and trade (called: 'Sige Xuke', four permissions). It also enacted a special committee to manage the newly formed market (Figure 2H; Ding, 2009; GaoHua, 2000).

Over the next decade, Yiwu expanded and consolidated its leading position as a trader of low-technology products, such as soap, socks, shorts and toys (Yueh, 2013). The turn-over of the wholesale markets nearly tripled annually (Figure 3) and products diversified, leading to a de-facto break with the doctrine of "one village, one product" inherited from the communist period (Bellandi & Lombardi, 2012). Firms institutionalised their distribution systems and established marketplaces in China (Ding, 2009). Following initial capital and knowledge accumulation, local booth keepers were able to open small workshops in and around Yiwu. Local government provided the required infrastructure, constructed and managed wholesale markets and two industrial belts and enacted local industrial policies (Figure 2H; Ding, 2009). At the same time, labour markets, finance and support systems increasingly specialised in low-cost trade and manufacturing. In these early years, Yiwu's firms faced limited competition, because other Chinese regions did not offer suitable institutional policies, infrastructure and entrepreneurship. This uneven playfield slowly changed. In May 1984, central government eased its level of control in its "Provisional Regulations on Expanding the Autonomy of Enterprises" and in 1986 private producers were allowed to trade directly with wholesalers (Ding, 2009). However, national policies, practices and attitudes towards private firms remained opaque (Jacobs, 2010).

Yiwu became China's largest wholesale commodity market in 1991. The success of the market and the enabling local industrial policies (Figure 2H) attracted

Table 2: Firms' innovation strategies.

		Level of product innovation		Total
		Low ¹	High ²	
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% (n = 105)	11% (n = 13)	(n = 118)

¹Low entails a score of 1 or 2 on a Likert scale from 1 to 5.

²High entails a score of 3 to 5 on a Likert scale from 1 to 5.

Source: Authors.

more and more traders. In 1992 local government started supporting manufacturing in addition to trading, which resulted in the formalisation and further growth of small rural workshops (Ding, 2009; Yueh, 2013). The accumulation of knowledge, people and capital and the continued infrastructural investments created more locational externalities (Figure 2J).

The Chinese government incrementally introduced national industrial policies on property rights, licensing for industries and trading, financial services, industrial standards, education and training (Yueh, 2013). In 1992, President Deng formally confirmed the importance of market coordination during his Southern tour, which led to a greater acceptability of private firms. However, as the playing field levelled, Yiwu lost some of its institutional comparative advantages and growth rates reduced (Figure 2).

4.1.3. Self-Reinforcing Phase

In the 1990s, Zhejiang province moved towards high-tech industrialisation, while Yiwu turned its low-tech industry into mass-producing exports. Around the year 2000, global buyers noted the ability of Yiwu's firms to mass produce at low costs and offered large contracts (Figure 1I). The opportunity to produce for global buyers fitted well with the firms' expectation to work hard at low profit margins and offered new growth opportunities (Figure 1K). Exports led to the firm's integration in global value chains (Bellandi & Lombardi, 2012). Global buyers offered brands, designs and markets, enabling local firms to reduce costs by firing designers and marketers (respondents 1, 25, 31, 68, 95). This deepened Yiwu's specialisation in low-tech production and trade and led to dependency on the knowledge and orders of global buyers. China's membership of the WTO in 2001 boosted exports. The Ministry of Commerce granted Yiwu, as first city, the right to hold international exhibitions and established a service centre in Yiwu to offer faster export services. At the same time, local government stimulated exports via city branding, trade fairs, training, an airport and train connections, eased export regulations and the construction of wholesale markets for exports and 12 new industrial zones. Related sectors such as insurance, hotels, restaurants, logistics and packaging mushroomed as well (Mu, 2010).

4.1.4. Contemporary industrial structure

The contemporary industrial structure shows signs of a locked-in mass producing industrial complex. Growth rates decline, although it is still around 10% annually

(Figure 3) and firms indicate profit margins as low as 1% (Figure 2L). The leader of the business association notes that many entrepreneurs prefer to invest in real estate instead of reinvesting in their firm (respondent 105). Survey results furthermore show that 89% of all firms stick to process innovations despite falling profit margins, rising prices and increasing competition (Table 2). Roughly 45 percent of all firms are imitators, who are risk averse and regularly counterfeit designs from their clients or internet (respondent 3, 22, 32, 91). Price-fighters opt to strategically innovate production processes in response to competition, labour shortages and rising labour costs (respondent 1, 126). Most produce the clients' design, but also counterfeit designs for sale at the wholesale market.

Yet, the industrial structure also includes a small group of innovative family firms, led by high educated managers. They innovate products and processes, develop their own brand name and demand large profit margins in high-end market niches in China and abroad. They operate outside the mainstream institutional structure and forego the benefits associated with increasing returns (respondents 1, 76, 83, 92, 125).

We also find factors pushing for path creation at the level of the landscape and institutional niche. National, regional and local government have established ambitious policies stimulating product innovation (see next section). At the niche level, about 5% of all firms are designers, operating at the China Yiwu Industrial Design Centre (Table 2). The centre attracts design firms by offering free accommodation and tax exemptions. The designers especially service their parent companies outside Yiwu and hardly connect to local firms. They complain that it is hard to attract designers to Yiwu (respondents 105, 108).

4.2. Analysis

This section analysis how factors of lock-in, path extension and path creation influence the development trajectory based on the indicators (Table 1) and the timeline described above.

4.2.1. Lock-in

The analysis of the timeline confirms the factors leading towards a lock-in as mentioned in Table 1. The expectations of entrepreneurs are engrained in hundreds of years of bartering, working in family firms and working within trusted family and trade networks. These initial events show a high degree of non-ergodicity. Firms expect hard work, produce large volumes and make low margins. Respondent 72 exemplifies the adapted expectations: 'Innovation is not important for Chinese import and export companies. We just follow customer instructions'. With such expectations, opportunities of a knowledge-driven economy are easily perceived as unviable.

Over the last five decades locational economies have materialised. Public and private investments in infrastructure and services in combination with efficient access to migrant workers have led to advantages of scale, which multiplied when firms entered global value chains and specialise in low-cost production. The inclusion in buyer-driven global value chains led to industrial downgrading, as local firms fired designers and marketers. It also created dependency on the designs, markets and

brands of global buyers. Learning in global value chains skewed the capacity of firms towards production and bargaining, which was awarded as it offered access to tacit knowledge of global buyers. Capacities related to product design, branding and marketing were not valued, as global buyers performed these tasks. Knowledge networks needed for branding and design remained unexplored, leading to high transaction costs of product innovation, unknown risks and unknown opportunities. At the same time, sunk costs in production technologies, buildings, migrant housing and production networks increased the costs of switching towards other development trajectories.

4.2.2. Path Extension

The study identifies factors extending Yiwu's low-tech development trajectory, thereby preventing or postponing path decay. Study findings show that firms have deepened their production capacities, as they have benefitted from improved education and training opportunities. They have also learned-by-doing in global value chains, which offer stringent standards and quality control. Deepened production capacities enabled firms to diversify to related products, markets and production technologies. Firms have been very responsive to market opportunities and volatility: they have opened marketplaces in China, developed new low-tech products and extensively copied existing product design for new, low-price market segments. When growth rates reduced in China, firms started exporting. However, our study finding show that most firms diversified to related low-tech products while their level of product innovation remains low. The mentioned path extensions remain within the low road of competitiveness. The emergence of related services such as insurance, hotels, restaurants and logistics offer a more knowledge-intensive development trajectory but is highly dependent on the clientele of low-tech industries.

Research findings show that industrial policies strengthen and extend the low-tech development trajectory. From 1978 onwards, the Zhejiang model allowed for the establishment of family firms, which offered firms an institutional comparative advantage. It unleashed the uncoordinated action of thousands of family firms. Regional and local industrial policies followed this self-organised development trajectory and incrementally added formal institutions in order to offer much needed rules and support services and infrastructure. The Zhejiang model was thus used as a pilot to develop local, regional and national industrial policy.

When Zhejiang province subsequently moved towards the high road of competitiveness, spearheaded by the success of Alibaba in Wenzhou, the central and provincial government allowed Yiwu to remain true to low-tech trading and manufacturing (Rui, 2018). Decentralisation policies of 1994 and especially its tax reform, which allowed local governments to retain 40 percent of industrial taxes, stimulated Yiwu's local governments to continue supporting low-tech industries. Local government continued lobbying for mass production, resulting among others in a special tax procedure in 2014 and inclusion in the Road and Belt Initiative (Shen et al., 2018). It also continued constructing low-tech industrial parks, wholesale markets, transport infrastructure and housing for low-skilled migrants, thus adding to the locational economies (Rui, 2018). This indicates that industrial policies extend industrial pathways but do not overcome the functional, political, cognitive (Grabher, 1993) and spatial lock-in. We therefore conclude that industrial policies are

a part of the path dependent process, whereby also politicians and urban professionals have adapted expectations. By improving efficiency gains and building capacities they extend the development trajectory.

4.2.3. Path Creation

Political changes at the landscape level have influenced the direction of Yiwu's economic development trajectory twice: the introduction of a centrally planned economy in 1949 and the gradual introduction of a market-economy from 1978 onwards. While these moments of path creation had a major impact on the development pathway, they did not change Yiwu's informal institutions (expectations created by bartering, family firms, guanxi networks, entrepreneurship).

At present, three isolated and small trends offer hope for path creation, this time possibly leading to the high road of competitiveness. Factors leading to alternative pathways are external to the industrial structure but also include agency. A first trend is the emergence of a niche of designers housed in China Yiwu Industrial Design Center. This is a business incubator, an institutional concept imported in Yiwu, which aims to stimulate an innovation-driven economy in a protected institutional environment. The designers come from all over China, attracted by free housing, a tax holiday and subsidies. They innovate products for their mother companies. However, the firms hardly network among themselves or with other firms in Yiwu and indicate that they have difficulty in attracting designers (respondent 105, 106, 108). It is thus still an isolated niche, which has not yet resulted in institutional change of the mainstream industrial structure.

The second trend comprises a small group of innovative firms whom service niche markets in China and abroad. They respond to landscape changes in public opinion, which increasingly turn away from mass production. Ever since 1986, and especially after joining WTO, Yiwu's model became associated with fake goods and low quality. Once China's economic growth slowed down and environmental problems became increasingly visible, national policies and opinions moved away from mass production (Fu and Gong, 2011; Rui, 2018). We find that especially changes in consumer behaviour have motivated innovative firms to invest in product innovation (Rui, 2018). This alternative trajectory is agency based (Grillitsch & Sotarauta, 2018), but does not yet lead to changes in the mainstream industrial structure.

The third trend is that Yiwu is selected as the only e-commerce demonstration project under the Belt and Road Initiative. The national government issued permits and policy support, endorsed by Zhejiang province and Yiwu council, to construct and subsidize e-commerce demonstration zones. However, the project is held back by the shortage of designers and marketers and by anxiety of consumers and foreign governments about limited consumer protection, low quality standards and high levels of product imitation (Yuting, Ying and Xiaohui, 2018). It is however too soon to assess if the initiative can overcome its path dependent constraints.

Study results thus find limited path creation, despite China's ambitious innovation policies. Within the mainstream industrial structure, we find that most firms are still imitators or price fighters (Table 2). They indicate that low cost production motivates them to locate in Yiwu (respondents 6, 71, 100, 128). Innovation policies do not have a significant impact for four reasons. First, innovation policies are only partially relevant for low-tech mass production family firms. China's first innovation

policies of 1985 focused on radical, high tech innovation within State Owned enterprises, research institutes and universities (Tang & Hussler, 2011). From the 1990s onwards, however, policies include endogenous innovation of SMEs. This became a national top priority in 2006, but maintained its high-tech focus (Fu & Gong, 2011; Tylecote, 2006). Nevertheless, various innovation policy instruments benefit low-tech SMEs as well, especially private property laws, technology markets and national transfer technology centres (Tylecote, 2006). In Yiwu, local government also established ambitious policies to increase R&D expenditure of SMEs to the level of Swiss by 2015, but it might be too soon to measure results.

The second reason for the failure of innovation policies is that Yiwu's policy implementers are path dependent themselves. Instead of offering a trusted environment for reciprocal knowledge exchange, they continue to hierarchically implement government policy in support of mass production (respondents 1, 31, 122, 107, 108). Firms visit local government, associations and platforms to obtain support for licenses, migrant labour and to acquire land, but not to exchange knowledge.

The third reason for policy failure is that innovation instruments are used to stimulate process innovation instead of product innovation. They thus deepen low-tech specialisation. Yiwu implements four policy instruments. The first is the enactment of rules of appropriation. By now, close to 50% of all respondents apply for patents and many undertake actions when large firms copy them. However, firms mention that application and control are complex within low-tech industries, especially in a sector dominated by SMEs (respondent 31 and 103). Second, investment subsidies are awarded, but mainly used to invest in production technologies, to visit trade fairs or to develop websites. This leads to process innovations and diversification, instead of product innovations (respondent 4, 42, 61, 129). Third, Business Development Services offer access to market information, export promotion and training (respondents 4, 66, 132). This policy instrument primarily extends the low-tech development trajectory as well.

A fourth and final reason for the failure of innovation policies to date is that landscape pressures offer mixed signals. While innovation policies and the negative public opinion of mass production incentivize the establishment of high-tech industries, China's multibillion Belt and Road Initiative supports the export of low value-added products. Within Yiwu, macro trends such as massive immigration of low educated people and outmigration of designers and marketers have led to huge shortages of the higher educated needed for knowledge-intensive industries, which creates disincentives for a knowledge economy.

5. Conclusions

Old industrial areas face a major challenge once profit margins reduce and development trajectories of mass production decay. Their institutional structure, spatial structure and political systems may create a lock-in (Grabher, 1993). We analyse Yiwu's lock-in based on Arthur's (2000) model of increasing returns. Our study findings confirm the risks and factors of a lock-in (Arthur, 1989 & 1994; Martin & Sunley, 2006). Long-term path dependent processes may deeply engrain informal institutions in support of low-tech mass production within the economy, society and government. Formal institutions follow suit. This process may result in locational economies and an overly dependence on the markets, brands and designs of global

buyers. The firms, governments and other actors adapt their expectations, while over time capacities are skewed towards mass production. At the same time, the cost of switching to a knowledge economy are high due to sunk costs and costs of unlearning.

Recent research has shown that path dependence can also lead to new path development (See for instance Grillitsch et al., 2018; Martin, 2010; Martin & Sunley, 2006). In order to explain multiple development trajectories, we identify factors of path extension and path creation. In Yiwu, we find evidence of path extension as firms branch out to related markets, products and technologies. Related diversification (Neffke et al., 2011) is enabled by the incremental deepening of the firms' capacities in training, education and learning-by-doing in global value chains (Fransen & Knorringa, 2019). By contrast, we find only minor indications of path creation towards a knowledge economy. External stimuli and innovative entrepreneurship have however planted a few seeds of path creation (Geels, 2004; Geels & Schot, 2007; Grillitsch & Asheim, 2018; Isaksen et al., 2018; Trippel et al., 2018).

The role of policies in new path development is debatable. Neffke et al. (2011) argue that path extensions are self-organised. Our study findings confirm this argument, as the uncoordinated actions of thousands of Yiwu's firms have led the way towards mass-production. However, we find that industrial policies can extend a regional industrial pathway. Industrial policies include an enabling business environment, education, training and investments in public infrastructure, housing and services. By contrast, innovation policies aim to create an alternative development trajectory which overcomes the lock-in. A caveat is that innovation policies demand capacities and knowledge networks which tend to be weak in old industrial regions (Isaksen, 2015). The study finds that innovation policies in Yiwu have not yet significantly contributed to new pathways as they don't specifically target low-tech family firms, implementation capacity is limited, instruments are not well targeted and institutional incentives are diffuse.

Nobel Prize winner Dennis Gabor (1964) wrote: 'The future cannot be predicted, but futures can be invented'. By the same token, we can't predict path decay, but we can recommend policies to prevent such a painful process. In old industrial areas, such as Yiwu, we argue in favour of landscape pressure and niche experimentation in order to stimulate feasible, innovation-increasing alternatives (Geels & Schot, 2007). At the landscape level, innovation policies, city branding, societal debate across public, private and civil partners and political lobby may open the eyes to alternative development trajectories. Urban planning, including the provision of amenities and housing, can make cities more attractive for innovators and designers. Niche developments can support innovative industries and lead to embryonic regional innovation systems in relative isolation from the dominant institutional structure (Geels & Schot, 2007; Grillitsch & Asheim, 2018; Isaksen et al., 2018; Martin & Simmie, 2008; Martin & Sunley, 2006). This development can link to existing innovative firms, adding structure to agency. We recommend developing local brands within local and regional value chains as an alternative development trajectory, in order to bypass the dominance of global value chain leaders (Fransen & Knorringa, 2019).

We recommend research on the roles of the landscape and niches in path creation in old industrial areas. Path creation is risky and takes long, while old industrial regions face urgent problems. Relevant research questions are: how do old industrial

areas combine path extension with path creation? How can a region create a parallel knowledge economy, while (temporarily) extending its mass production industry? We recommend empirical research, including multiple case studies, in order to appreciate differences between industrial pathways across time and space.

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