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Introduction and Aim of the Dissertation

The aim of this dissertation is twofold:

- 1) To add to a meaningful conversation on financial markets by using less conventional, yet empirical, methods, which differ from the dominant statistical empirical methods;
- 2) To provide a case study of an application of the less conventional methods, i.e. methodological pluralism.

While the various chapters may appear somewhat unrelated, the thread throughout is the interplay of theory and practice in financial markets.

Theory and practice have also played a constitutive role in the conception and production of the dissertation. It is the product of the author's experiences of the past thirty years in and around financial markets. More specifically, it has arisen from ten years of studying economics, finance and philosophy of science in academia, ten years of working experience in the sector itself (trading and asset management) and many years of policy-oriented research, mainly focused on the financial sector and the great financial crisis of 2007-2008. Combining these various levels of observation is somewhat unusual. I do not pretend to provide an exhaustive analysis on each level. Further elaboration on each of the levels is most probably possible, especially because both the practice of and academic thinking on financial markets have evolved and because I haven't always been part of the particular conversations on theory and practice.

1.1 WHY?

Financial markets are markets where financial products are traded: i.e. claims to assets such as stocks, bonds, currencies, derivatives, etc. Today's image of financial markets is one of big banks housed in skyscrapers, crowded exchange floors and yes, greed, crisis and turmoil. The perception has become negative because of the Great Financial Crisis in 2007-2008 and the ensuing recession. Yet such markets are a deeply ingrained part of modern society and serve a number of valuable functions: borrowing and lending, price determination, information aggregation and coordination, risk sharing, provision of liquidity and increasing (cost) efficiency by reducing transaction costs. The functions ultimately boil down to dealing with the problem of intertemporal consumption: how much to consume today and how much to save and/or invest for future use. The issue is relevant on all economic levels. An individual has to decide what to spend on items such as food or clothing today and how much to save for later, for instance for education or retirement. Corporations have to decide what to do with their profits: pay dividends to shareholders now or invest in order to create future profits. Governments face the budgeting question of how much taxes to raise and how to use the proceeds. Financial markets provide solutions to these various dilemmas by giving the

opportunity to transform the use of economic means with regard to purpose, location and time. Thus one can choose to buy insurance against certain events, borrow and lend money, consume, save and invest. Put differently, financial markets provide economic agents with a means to deal with risk, time, and uncertainty.

Financial markets are also very much a necessary institution to maintain and improve economic well-being on a macro-level. It would seem inconceivable for underdeveloped areas in the world to improve without, amongst other institutional characteristics, some form of financial means, for instance in the form of development aid, foreign investments and credit to local entrepreneurs (see Rajan and Zingales, 2003). Though financial markets affect pretty much anyone, even those who do not want to have anything to do with this trademark capitalist institution, the public at large commonly has taken their existence and functioning as a given. Only in times of crises when things that were taken for granted come under threat, do the markets make the headlines and get widespread public attention. That attention is negative most of the times because crisis breeds discontent. Thus financial markets are often regarded as a necessary evil, despite their importance and necessity. Their existence is continuously questioned, at least by important parts of the public.

Rajan and Zingales (2003) argue that competitive markets can be seen as a form of a public good. No one can be excluded from using them and use of them does not affect availability to others. But their existence and well-functioning are not a given. This applies to financial markets as well. Incentives and pressures are there that threaten their well-functioning. The threats arise from various sources. First of all there is a more or less natural process of competition. Market participants try to perform better than their competitors; if they do they may gain some form of market power. As less performing market participants are weeded out and if for some reason barriers to entry exist, successful market participants may develop a degree of monopoly power. Similarly, politicians and policy makers may have incentives to reduce competitiveness in a market, for instance for electoral purposes or in serving special interests instead of the common good. Attention needs to be paid to market structure because financial markets need to be liquid and transparent to function properly. This is where policy makers and regulators come in. Because, even while the very real possibility of distortion of competitiveness by politics and policy makers exists, at the same time Rajan and Zingales argue: “markets cannot flourish without the very visible hand of the government, which is needed to set up and maintain the infrastructure”. In other words, unregulated markets are by no means always preferable to regulated markets, and vice versa.

That implies that the provision of public goods may require some form of collective action and that applies to financial markets as well. Usually governments are counted on to take that collective action. However, some public goods can be regarded as international or

global public goods, for instance the global climate and levels of pollution. In these cases some form of supranational coordination is necessary to ensure efficacy. The same applies to financial markets, simply because these are ultimately global markets. The great financial crisis of 2008 has it made painfully clear that the well-functioning of financial markets is an international matter, not a national one.

Within economics a significant subfield that deals with financial markets only started to develop after World War II. Subsequently the subfield, called finance or financial economics, went down its own path. Meanwhile, within the wider realm of economics financial markets were seen as a complementary institution to the real economy, which they were originally. The opinion was broadly shared by economists of varying schools which in turn influenced economic policymakers and politicians. The view was that economic processes are primarily driven by what happens in the real economy; what happens in the financial sector is a consequence of events in the real economy. This view has been formalized in most economic planning models that policymakers use and thus became embedded in actual economic policy. However, the financial crisis of 2007-2008 and the resulting fallout for the real economy serve as prime evidence that the relationship between the real economy and the financial sector is way more complicated and that turbulence in the financial can have serious repercussions on the real economy.

Finance became in the 1970s a hugely successful academic discipline within economics in terms of publications, journals and prizes, numbers of faculties, staff and students, and funds directed towards the field. It became the dominant conversation with regard to financial markets. Fuelled by some major breakthroughs, however, the focus of finance increasingly shifted away from looking at the functions of financial markets and towards investigating how the markets functions. Their existence, the primary function and its place in the economy were also taken as a given by financial economists and so they committed the same mistake in decoupling financial markets from the broader real economy. The dominant conversation was thus only dealing with a part of the phenomenon, although an important part.

The academic discipline of finance did more than analysing and theorising. It did significantly impact the markets themselves, in shape, size and structure. Theoretical developments such as the development of pricing models and new instruments such as various derivative products profoundly altered the markets and the world. In combination with the advance of technology the result has been that the market for money and capital is the largest, most international and most globalized market on earth. Money and other financial products fly all over the world in staggering amounts, twenty-four hours a day, transcending countries and continents. That material transcendence and their sheer size have made financial mar-

kets in a sense ungraspable for the public, for policy makers and perhaps also academics. An institution which in essence was complementary to the real economy, has become an 800 lb. Gorilla, a wild and dangerous beast which is nevertheless crucial to our well-being.

So on the one hand financial markets would seem a somewhat hard to grasp phenomenon which nevertheless affects us all, yet on the other hand our knowledge about these markets is fragmented and the attention devoted to it outside of its specific academic and professional realm limited and often ill-aimed. I aim to connect some of these fragmented thoughts and to provide some focus on how we can look at various aspects of financial markets using different tools from the toolbox of economics and other sciences. The goal is broadening and improving the conversation about financial markets, beyond what mainstream financial economics already has to offer.

1.2 HOW?

Financial markets can be looked upon in various frames. Sheila Dow (2016) has argued that these various ways of framing financial markets provide an argument for a pluralist or multidisciplinary or interdisciplinary approach beyond what financial economics has to offer. Moreover, financial markets, like most economic phenomena, are essentially an open system (ibid.). The links with other systems and entities (the real economy, firms, individuals, governments, etc.) are numerous and the boundaries not clearly marked. An employee with a pension plan is part of the financial sphere because his retirement savings will be the proceeds of some investment decision, individual or collective depending on legislation and regulation. At the same time the pension plan forms part of the labour compensation package of the employee and the operational budgeting considerations of the employer.

All economic phenomena are to a large extent social phenomena, depending on a multitude of interactions between various agents. That implies that the phenomena are not easily captured by covering laws like the iron laws of nature. Rather there are causal mechanisms at work which may give to rise to tendencies which are not necessarily permanent or persistent and can be affected by other mechanisms and may evolve as context and environment change. Much of economics is an attempt to depict causal mechanics (rather than covering laws). The issue is than whether these mechanisms are correctly described or whether the targeted mechanisms suffice for explanation and understanding.

Besides the goal of an improved understanding of financial markets I offer a pluralistic (with-in economics) approach (and to some extent also multidisciplinary and interdisciplinary)¹. Finance in fact has pluralist origins. It is by no means a simple offshoot of economics. When one looks at the background of the main characters involved, one finds quite a colorful variety: mathematics, physics, medicine, law, French, and indeed economics, to name some. Much of the ground-breaking work has been done outside economics faculties at business schools, and even outside of academia at think-tanks, consultancy firms, banks and investment firms. Theory and practice in finance have had striking proximity, which has been a catalyst in the rise to prominence of financial economics. I said that academic finance has had a profound impact on the financial markets. The opposite is also true: the markets provide researchers with input: an incredible amount of empirical material in the form of asset prices and other market data. When thinking and theorizing about financial markets it is very much worthwhile to look at the practice and the practitioners.

Various types of pluralism can be identified (Dow, 1997) so some elaboration is needed on what is meant here, where pluralism applies and where not. Earlier in this chapter the functions of financial markets at the most basic level were set out: transformation of economic means for several different purposes, locations and times. Financial markets, even when being an open system, have emerged, exist and persist and they do so for a reason. In that sense the analysis here is ontologically monist, not pluralist. For example, as will be discussed in chapter five, derivatives markets do not exist because of the discovery of how to price derivatives but because they provide an economically efficient means to deal with risk, time and uncertainty.

However, monism on the ontological level does not imply that the ways to gain knowledge about financial markets, the methodological perspective used, and the specific methods to analyze are restricted. Put somewhat differently, the idea is that there can be many theories relating to one phenomenon (Mäki, 1997), different methodologies may add value (Dow, 1997) and diverse methods may shed light on varying aspects of the phenomenon (Groenewegen and Vromen, 1996).

John Davis (2019a) makes a useful distinction in this regard between methodological assumptions and substantive assumptions. Ontological claims involve substantive assumptions, he argues, and these assumptions involve ideological differences between researchers. He adds that these “ideological” differences between researchers may be considered irreconcilable” (or may be perceived as such), whereas conciliation is possible in regard to methodological assumptions. It is the latter type of conciliation that is mainly explored here.

1 Given opaque boundaries of a discipline pluralism within a discipline may or may not be a form of multi- and/or interdisciplinarity.

However, conciliation on the methodological level may also hint at the possibility of some reconciliation on the ontological level where it concerns substantive assumptions. Perhaps, at least in finance, the differences and disagreements between various economic schools of thought and other disciplines actually do not run as deep as they are often portrayed in a polarized academic arena.

Epistemological pluralism thus concerns methodological assumptions and is a matter of what different schools of thought (inside or outside of economics) have to say about financial markets. The idea is that different economic schools of thought provide meaningful insights, be it in terms of knowledge, justification, truth, adequacy, etc. With regard to financial markets the dominant paradigm is financial economics, in particular what has been labelled by Ross (2005) as neoclassical finance. Its key claim is that financial markets, if properly set up, will tend to efficient outcomes. Behavioral finance has become the main challenger to this paradigm. Because agents act less than fully rational in their decision making, deviations from efficiency will arise and persist and suboptimalities at the collective level can and do happen. The dispute between these two seemingly competing paradigms is further explored in chapter three. While these theories may appear rival they need not be in that different questions may be concerned which may relate to different subjects. The idea that behavioral and neoclassical finance are not rival but to a large extent complementary, is further explored in chapter four where another school of thought, Austrian economics, is used to bridge the apparent gap between neoclassical and behavioral finance.

Chapter four is an example of methodological pluralism: the use of different methodologies in relation to a phenomenon. Neoclassical and behavioral finance to a large extent share the same methodology². Theories are presented as formal models. The models are then (often statistically) tested by examining hard data which leads to a verdict of either right or wrong. The Austrian School does share the tenet of methodological individualism with both neoclassical and behavioral economics but does have a fundamental distrust of quantitative methods and formal modelling as a means of capturing human action. The case is made in chapter four that their descriptive methodology can complement narrowly empiricist approaches.

2 Dow (2016) uses the label “logical positivism” to characterize this methodology. Whether that is a fortunate characterization can be debated, given the extensive philosophical discussions of the past on the subject of logical positivism (see for instance McCloskey, 1985). Dow identifies three key elements of what she labels logical positivism in economics. Besides empirical testing and the right/wrong demarcation she mentions the axiom of rational behavior. Following Ross (2005) and others, I do not subscribe to this in the case of finance. As Ross mentions, finance has taken a step back from this axiom in that in a well-structured and functioning market efficient outcomes come about by the arbitrage mechanism: a few rational acting agents suffice. See also chapter four.

That different methodologies can complement each other in that they relate to different aspects of a phenomenon does not say anything about the use of different methods for one and the same aspect of the phenomenon. Pluralism in method may actually be always be present. McCloskey (1990) has argued that while economists may extensively use the formal method of mathematics and modelling, in reality they are telling a story. McCloskey's point that economists should be aware of, and pay attention to, their narratives, is taken up throughout the following chapters. Statistical significance and neat regressions are not the only "facts" that matter. Financial markets lend themselves particularly well to this kind of testing: many of the processes are highly visible and financial markets produce an unrivalled amount of numerical data. The narrow empirical approach may however be well served by adding qualitative analysis of possible underlying mechanisms and institutional arrangements, and illustration by case studies and real-world examples³. That becomes even more important if indeed, as many hold (see for instance Bernstein, 1992, MacKenzie, 2005, Soros, 2013), theory and practice massively influence each other with regard to financial markets. In connection to this, it is interesting to observe what scientists actually do, in their scientific work but also beyond when they try to put their theories to the test in the market or in the arena of policy-making.

The argumentation in the analysis presented here makes use of quite different methods. A large part consists of historical data sampling and statistical investment analysis. As such, these can be regarded as a contribution to the quantitative turn in economic methodology and the history of economics (see for instance Dütte & Weintraub, 2018, Edwards, Giraud & Schinckus, 2018 and Cherrier & Svorenčík, 2018). But descriptive accounts and philosophical reflection are also employed.. The common denominator here is that all analysis is empirical or makes use of empirical observations⁴. Besides hard data, observations from the practice of the financial markets are used⁵. With regard to the realm of academics it is observed what scientists actually do, in their scientific work but also beyond, when they try to put their theories to the test in the market⁶. The interplay between theory and practice plays an important role throughout this dissertation. Many advocates of theoretical pluralism, me included, greatly stress that pluralism does not imply that "anything goes", to use the famous phrase of Paul Feyerabend (1975). However, with regard to pluralism in

3 Colander (2000) has argued that the label "neoclassical economics" in fact covers the descriptive, institutional brand of economics from the 1940s and the more formal modelling approach from the 1950s. A similar move, which is described in chapter two, can be found in finance.

4 Most of the research in modern financial economics is empirical but usually restricted to statistical data analysis.

5 These observations include experiences from the author's ten year career as a trader and manager in the financial markets.

6 Inspiration in this regard has been drawn from the field of social studies of science.

method there is no reason why certain methods or ideas should be excluded a priori as long as a serious confrontation with reality can be conducted.

1.3 WHAT?

In chapter two an extensive historical analysis is presented of the dominant discourse about financial markets, that of finance. The diversion between economics and finance is discussed and the development of finance through time, away from a more general macro-oriented perspective towards analysis of firms, markets and specific assets on the micro level, is displayed. Epistemically and methodologically the impact of the ground-breaking theoretical advances in the 1960s and 1970s becomes clear, in particular in the domains of asset pricing, efficient markets and agency theory. The lack of similar novel ideas since the 1970s combined with technological advances which have massively enlarged the possibilities for working with data, have resulted in predominantly quantitative empirical work.

That is not say that thinking about financial markets has gone stale. On the contrary: the breakthrough of behavioral economics, based on insights from psychology, has been largely fuelled by research on and data from financial markets. Chapter three explores the divide between the traditional neoclassical view that financial markets are to a large extent efficient and this most prominent challenger to that paradigm: the behavioral view that there are persistent deviations from efficiency because agents act less than optimally rational. It does so by looking at a very specific data set: the results of professional money management operations with which leading neoclassical and behavioral finance scholars are associated. The data do not provide crystal clear winners in terms of risk and return. In addition, there is no trace of exceptional performance when top academics are involved.

In chapter four it is argued that neoclassical and behavioral insights can be reconciled to a large extent by means of the Austrian theory of the market process (Kirzner, 1992). At the core, the behavioral claim of less than optimal rationality pertains to individual agents, while the neoclassical claim of efficient markets pertains to outcomes of interactions between many agents. The question then becomes if and how these interactions of less than perfect agents result in efficient outcomes. In the neoclassical account it is assumed that arbitrage—quick elimination of opportunities for excess profits—will ensure market efficiency. How realistic is that assumption? By looking at arbitrage as a dynamic market process where entrepreneurial discovery and learning take place content is given to that assumption. The upshot is that it may be more appropriate to talk about markets tending towards equilibrium, allowing for deviations from market efficiency which in time will be corrected. This could explain why

asset prices often display more volatility than is logical from an efficient markets standpoint, an important observation made by behavioral finance (Shiller, 2003).

The Austrian account, by focusing on “entrepreneurial skills” does not assume a fully rational homo economicus, rather a rational but not omniscient operator. The entrepreneur looks for opportunities and explores those. He or she may err at times, perhaps learn from mistakes and will adapt his or her behavior. Thus outcomes, prices, markets can be inefficient but these will correct at some point and ultimately will find their way back in the “right” direction. Radical uncertainty (Knight, 1921) plays an important role in this account. For if we acknowledge that economic processes are inherently uncertain, the outcomes and developments of such processes cannot be completely anticipated by calculation or precise estimation. Behavior of agents will be a matter of best-guessing, trial-and-error and opportunism. The market is nothing more than a device which brings together these imperfect agents with different mindsets and opinions to come to a collective outcome.

There are other scientific disciplines than (financial) economics which have paid attention to financial markets. Originating in sociological and philosophical circles in the 1990s the social studies of finance have sprung up. The aim is multidisciplinary application of social science disciplines such as sociology, anthropology, human geography, gender studies, socio-legal studies, and science and technology studies to the study of financial markets (Preda, 2007). One of the most interesting results has been the so-called performativity thesis: the idea that theory can enact the reality that theory aims to describe (Callon, 1998) Stretched to the limit this results in the provocative claim that theories can enact reality even when the theory is lacking in some form.

In chapter two the powerful influence of a few breakthrough theoretical advances for thinking about financial markets is shown, This influence went way beyond the academic realm: theories profoundly changed what actually happened in financial markets, in some cases actually creating new practices. Option pricing theory and the congruent development of derivatives markets is a particular noteworthy example in this regard; one that has been used to illustrate “performativity”⁷. Chapter five examines these performative properties of option pricing theory. It is concluded that option pricing theory indeed has had a profound effect on financial markets, because people actually started using the theory in practice. But it is not the case that this happened even when the theory itself was defective. Here once again the importance becomes apparent of distinguishing between what a theory does and does not claim, as well as identifying the accompanying assumptions and how realistic these assumptions are. On the other hand the nature of economic reality should be kept in mind.

⁷ Cf. MacKenzie, 2006a.

Economic phenomena are social phenomena which are subject to complex interactions in a wide and changing context instead of following some iron law of nature. Such phenomena are not easily captured in one grand theory of everything.

Having said that, I argue, in particular in chapter four with regard to the behavioral-neoclassical dispute that apparently rival theories may turn out not to be rival at all but rather complimentary to one another. The behavioral camp makes its claims largely based on psychology and experiments. The neoclassical camp making equally credible claims about collective outcomes on the level of the market where many agents interact, largely based on micro-economic concepts. The point of departure of both schools of thought thus differs: behavior of individuals versus collective outcomes. In other words, behavioral and neoclassical finance use different mechanisms of explanation (explanans).

Regarding the object to which the explanans is applicable (explanandum), the solid claims of behavioral finance pertain above all to the level of individual agents/persons. From there, it is inferred that collective market outcomes can be less than efficient. On the other hand, neoclassical finance postulates, given certain assumptions that collective outcomes should be efficient because of the no-arbitrage theorem .

The question then arises how the different levels are related: which mechanism links the level of the individual economic agent to collective outcomes in financial markets? In the case of neoclassical and behavioral finance an inter-theoretic bridge is suggested, inspired by the originally Austrian market process account, which gives actual content to the principle of arbitrage.

Since 2007 financial markets and the thinking about financial markets have profoundly changed with the events that will be labelled here as the great financial crisis. The crisis would appear to provide a harsh clash between theory and practice of financial markets. Some of the issues for finance and economics that have emerged from the crisis are examined in chapter six. The issues are numerous and quite different in scope and content. The multiplicity and diversity makes an argument for a broader, more comprehensive way of thinking about financial markets. Chapter six contains a proposal for a broader, enriched conversation on financial markets, a new institutional finance. The basic idea is that a plurality of partial accounts can accommodate a variety of claims and thoughts about financial markets on various levels of aggregation and identify interactions between varying claims. Because the need for such a broader and deeper, simply better understanding of financial markets has become painfully clear..