

Department of Economics

Essays on Economics of Investment and Lending

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Publisher School of Business**Unit** Department of Economics**Series** Aalto University publication series DOCTORAL DISSERTATIONS 5/2022**Field of research** Economics**Date of the defence** 18 February 2022**Language** English **Monograph** **Article dissertation** **Essay dissertation****Abstract**

This dissertation consists of three separate essays.

In the first essay, I estimate the effect of venture capitalists' advice (measured by time) on the outcomes of their portfolio companies using data on Finnish companies receiving venture capital. I utilize the limited

life-span of venture funds to instrument venture capitalists' advice intensity. My results show that venture capitalists positively impact the growth rate of employment and sales of their portfolio companies.

In the second essay (jointly with Marta Giagheddu and Marco Casiraghi), we study Italian banks' behavior during the sovereign debt crisis of 2011. We use the crisis as a natural experiment to study how the banks behaved during these unusual times. Our results suggest that government debt crowded-out SME lending during the financial market dryout (7-12/2011), but the ECB's intervention (1/2012 onwards) restored lending conditions to the pre-crisis levels.

In the third essay, I study how misalignment of stockbroker's and investor's incentives influence the market outcomes. Stockbrokers use stock information to optimize the portfolios they manage, but they also distribute this information to their clients. I construct a model to study the agents' decisions and find that if a broker has a scale advantage in doing research compared to its clients there can be situations when a client should use the information from a broker even though the client knows that the incentives are not aligned.

Keywords Venture capital, instrumental variable, sovereign debt, crisis, stockbroker**ISBN (printed)** 978-952-64-0661-9**ISBN (pdf)** 978-952-64-0662-6**ISSN (printed)** 1799-4934**ISSN (pdf)** 1799-4942**Location of publisher** Helsinki**Location of printing** Helsinki **Year** 2022**Pages** 133**urn** <http://urn.fi/URN:ISBN:978-952-64-0662-6>

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Nöykkiö, 19 December 2021

Timo Autio

List of Essays

This thesis consists of an introduction and the following essays.

- (1) The Influence of Active Ownership – Evidence from Venture Capital Investments in Finland
Unpublished manuscript.
- (2) Bank Lending and Sovereign Debt Availability
Unpublished manuscript.
- (3) Should You Listen to Your Broker?
Unpublished manuscript.

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Introduction

This thesis consists of three essays on microeconomics. They do not contribute to a single branch of literature but rather apply varying methodologies to study the incentives, actions, and outcomes at different junctures of financial decision making. All essays study how the existing financial infrastructure influences agents in their respective markets.

Even though the essays do not share the topic they share focus on how people respond to incentives, which I find to be one of the most interesting and elementary parts of microeconomics. Theoretical microeconomics often maps out what are the possible outcomes given constraints that are formed by existing incentives, or proposes an alternative incentive structures to improve the current outcome. Empirical microeconomics on the other hand often aims to estimate what is an impact of a policy change. Policy changes usually change incentives people face and thus the literature is interested in estimating the impact of these changed incentives.

Sometimes, incentives are observable to everyone and analyzing them is straight forward but often that is not the case and the researcher needs to find right tools to be able to find the answer. A significant part of economics is the process of thinking through the problem and applying an appropriate tool set to the problem at hand. Sometimes the best tool is a theoretical model, sometimes it is a treatment effect estimation, and sometimes the combination of the two. In these essays, I analyze incentives and their impact on the agents' behavior and outcomes both from theoretical and empirical viewpoints. The rest of introduction gives a short summary of the essays.

In the first essay, I estimate how a Venture Capital investor's involvement impacts the companies' outcomes. The incentive of the venture capitalist to be involved with a portfolio company is the financial profit that comes from two different sources. First, the venture capitalist gets a fee from the assets under management and

second, a share of the profits when they sell the initially acquired share of the company. The time frame of these investments is relatively short and there is urgency involved with the decision making compared to more established companies. This essay makes two contributions to the venture capital literature. The first is that I combine data from commercial and government sources to get as comprehensive a picture of the Finnish venture capital industry as possible. My second contribution is a new instrumental variable based on the institutional structure of the industry to overcome the selection bias in the estimates.

Compared to the rest of the European countries Finland has high level of venture capital activity and it is concentrated in the early stage of investment (Pajarinen, Rouvinen and Ylhäinen, 2016). Finnish data allow me to study the part of the venture capital market that is not usually well represented in the data. For example, in the US the smaller companies are not required to publish their financial data the same way as in Finland. Regardless of the problems in the data, venture capital industry has attracted a lot of public and academic attention. We do know that venture funded companies are different from other companies (Puri and Zarutskie, 2012) and there is some evidence that VC investors' activities are not limited to the selection of portfolio companies but the activities also have a causal effect (Bernstein, Giroud and Townsend, 2016; Colombo, D'Adda, Malighetti, Quas and Vismara, 2017).

My estimations suggest that increasing the amount of time a venture capital investor spends with the company has a positive effect on the growth rate of personnel and sales. The results for granted patents and bankruptcies are inconclusive and the estimates give tentative support to the view that the venture capital investors increase the probability of applying for a patent. Although statistically significant, the estimates are not particularly accurate. The signs of the results excluding the level of sales are consistent with the previous literature confirming that VC investors have impact on the development of the company (Bernstein et al., 2016; Colombo et al., 2017). From the incentives perspective the results seem to make sense. The venture capitalists want their investments to gain as much value as possible during the relatively short time of the investment. When the companies are small start-ups it makes sense that one of the most effective ways of maximizing the value of the company is to show that its' product or service has a large potential market. Thus,

growth of the company is a natural target and the profitability is a secondary goal in the early stages of such a company's life.

The second essay is a joint work with Marco Casiraghi and Marta Giagheddu. We investigate how a high issuance of (Italian) government debt affected Italian banks, lending to firms depending on how exposed to the foreign wholesale market prior to the debt crisis. In particular, we aim to find out if the government debt crowded out lending to small and medium sized enterprises. The debt crisis gives us a setting where the banks environment and incentives change exogenously from a bank's perspective. During the debt crisis, GIIPS¹ governments faced a strong need for debt refinancing. This means that the banks were under pressure to find buyers for the government bonds. Meanwhile, private firms suffered from a recession-driven drop in demand and needed liquidity to survive. As foreign investors reduced their exposure to high-spread Euro Area sovereign debt (Arslanalp and Tsuda, 2014), a large share of the government bonds were absorbed by the domestic institutional investors, in particular by the banking sector. Along with the debt crisis, the interbank lending market dried out with important repercussions for the banks that were heavily exposed to this market (Chernenko and Sunderam, 2014). In December 2011, the ECB expanded the set assets it accepted as collateral allowing the banks an easier access to the LTRO (long-term refinancing operations) program aimed at restoring the banks' liquidity position.

The crisis period provides a unique setting, which allows us to study the banks actions when their own capital structure was restricted. The ECB's intervention through expanding the set of assets accepted as collateral relaxes the liquidity dry-out and we are able to observe how did the banks reacted to this change in their incentives. The main contribution our essay makes is to study the interaction of sovereign debt issuance and SME lending because that has been the area where the least attention has been in the previous literature. We find that zooming in to the SME's is particularly important since they have fewer alternative sources of financing but represent a significant proportion of the economy in Italy and in Europe. Our results show that when a government issues a lot of debt during a period of liquidity dryout, it has a negative effect on the SME lending. On the other hand our results show that the ECB's intervention effectively normalized the

¹GIIPS is the acronym identifying Greece, Ireland, Italy, Portugal and Spain.

lending conditions for the SMEs.

In the third essay I analyze an incentive discrepancy between a broker and an investor. Financial intermediaries distribute information through different channels: newsletters, company reports, and trade recommendations. A lot of this information used to be free for clients who produce enough commission to their broker. This practice was brought to an end by the EU-wide MiFID II regulation implemented in January 2018. MiFID II, is wide legislative framework with an aim to "...strengthen investor protection and improve the functioning of financial markets making them more efficient, resilient and transparent."²

The regulation covered a lot of different areas, but for this essay the relevant change required brokers to charge separate fee for their stock analysis, which covers the costs of the research. The concern was that the incentives of investors and brokers are not aligned. Given that before the regulatory change, the practice of brokers distributing the information to investors was long lasting it raises a question: is an investor worse off if they delegate the stock research to their broker? If investors were truly worse off it would imply that they were not able to learn over time that the recommendations from their brokers lead them to lose money. Alternatively, if investors did not change their behavior based on the recommendations brokers spend extra resources in providing them.

The basis of the regulation appears to be undeniable: the incentives of an investor and their broker are different. The investor wants to maximize their risk corrected returns while the broker wants to maximize their trading commissions. In this essay I analyze the incentives of investors and brokers to better understand if they are pulling to different directions or if the information from brokers can be beneficial.

This essay is related to three bodies of literature. The basic setting in my model is heavily influenced by Grossman and Stiglitz (1980) whose seminal paper set out a framework that has been used to analyze how to sell financial information. Their main finding was that because investors can infer all the information from prices, no-one has incentive to pay for information production. This result is based on

²<https://www.esma.europa.eu/policy-rules/mifid-ii-and-mifir>, accessed 19.2.2020

the assumption of friction-less markets where everyone is able to process the information immediately. The rest of the literature has been introducing various exceptions why this seminal finding does not hold in real-life situations. The two early influential papers by Admati and Pfleiderer (1986) and Admati and Pfleiderer (1990) analyze how the sellers of information can avoid diluting the value of their information by either adding noise to the signal if they sell the information directly or by controlling the price impact if they sell the information indirectly. Indirect sales of information means that the informed party manages the money of the uninformed party for a fee, which can be think to be for example a mutual fund. Direct sales of information on the other hand is selling for example a newsletter, where the information is provided in a less accurate form and thus the dilution of the value of the information does not happen immediately through the prices. In their paper, Brennan and Chordia (1993) introduce the idea of that a broker can use the brokerage commission to compensate for the information they distribute to their clients, but in their paper, unlike in my analysis, the investor is fully capable of processing all the information they receive. More recently, García and Sangiorgi (2011) analyze the pricing of information sales when the seller can add varying amount of noise to the information. They find that the most profitable ways of selling information is to either sell inaccurate information to many investor for a low price of very accurate information to one investor for a high price.

The next branch of the literature that influenced my work is by Sims (2003), who formalized the idea of information-processing limitation. His idea has been used for example by Ozerturk (2007) in the paper where financial analysts can trade on their own account while hired to provide analysis for the principal. The main distortion comes from the information acquisition motivation of the analyst, which depends on the risk-aversion of the analyst. If the analyst is very risk-averse she acquires accurate information on the safe assets she has invested in, which is potentially sub-optimal for the principal who can would receive higher expected return on information on the riskier assets. The foundation for my essay is an article by Van Nieuwerburgh and Veldkamp (2010), in which the authors studied how an investor with limited information processing capacity should allocate their attention under different utility functions and information processing technologies. One of their main findings is that the results are sensitive to the choice of utility function form and thus choosing the form to match the reality is critical. My contribution

is to introduce a broker in the information acquisition framework and to analyze if an investor is always better off by ignoring information from a broker whose aim is to maximize the amount of trading.

The question of my research is: Does the broker's incentive to maximize the value of trading affect the utility of an investor with an information-processing limitation? My results show that when the assets are similar in terms of prices and variances the broker's motivation to maximize trading is mostly aligned with the investors portfolio optimization target and the investor's utility is higher with the broker's signal compared to the situation where the investor chooses the signal based on their prior information. If the investor has very accurate information on one asset and very inaccurate information about the other, then the investor is better off by ignoring the broker's signal.

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