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As a manuscript

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VENTURE CAPITAL FOR FUNDING INNOVATION PROJECTS
IN BRICS COUNTRIES

PhD dissertation summary
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I. OVERVIEW OF THE STUDY

Research problem. The year of 2021 impressed with record figures of venture capital (VC) invested worldwide at 621 billion USD, by far exceeding 294b USD set out in 2020.¹ VC market remained strong, feeding off the pandemic momentum of digitalization in consumer field and within B2B value chains. The academic literature stresses the importance of a vibrant VC market. Lerner and Tag (2013) emphasize that the ability of VC investors to overcome information asymmetries and provide capital to innovative business boosts economic growth.² Allen (2012) summarizes the positive effect of VC on welfare.³ Popov and Roosenboom (2013) and Popov (2014) find that VC increases the rate of new business creation.⁴

In line with the global trends, 2021 became another record year for emerging markets (EM), with Brazil, China and India experiencing new highs in VC funding of 9.4b USD, 130.6b USD and 38.5b USD, respectively.⁵ Nevertheless, these figures are far behind the U.S. market that reached its' own all-time high of nearly 330b USD.⁶

BRICS have been on the watchlist of investors for the last decade due to the impressive growth prospects and comparatively low competition in VC. In 2012, the first VC attractiveness index ranked China the highest among 83 emerging markets (and 22nd globally), with South Africa, India, Brazil and Russia ranking 3d, 7th, 10th and 15th, respectively.⁷ Nevertheless, the index shows that driving factors of VC attractiveness are skewed in these markets. They are generally characterized by strong economic potential

¹ CB Insights. (2022). State of Venture 2021 Report. URL: <https://www.cbinsights.com/research/report/venture-trends-2021> Retrieved on 11.05.2022.

² Lerner, J., & Tag, J. (2013). Institutions and Venture Capital. *Industrial and Corporate Change*, 22(1), 153-182. <https://doi.org/10.1093/icc/dts050>

³ Allen, F. (2012). Trends in Financial Innovation and Their Welfare Impact: An Overview. *European Financial Management*, 18(4), 493-514. <https://doi.org/10.1111/j.1468-036x.2012.00658.x>

⁴ Popov, A. (2014). Venture Capital and Industry Structure: Evidence form Local US Markets. *Review of Finance, European Finance Association*, 18(3), 1059-1096. URL: <http://hdl.handle.net/10.1093/rof/rft018> Retrieved on 06.07.2020.

Popov, A., & Roosenboom, P. (2013). Venture Capital and New Business Creation. *Journal of Banking and Finance*, 37(12), 4695-4710. <https://doi.org/10.1016/j.jbankfin.2013.08.010>

⁵ Bain. (2022). India Venture Capital Report 2022. URL: <https://www.bain.com/insights/india-venture-capital-report-2022/> Retrieved on 11.05.2022.

⁶ Pitchbook. (2022). Q4 2021 Pitchbook-NVCA Venture Monitor. URL: <https://pitchbook.com/news/articles/2021-record-year-us-venture-capital-six-charts> Retrieved on 11.05.2022.

⁷ Groh, A.P. & Liechtenstein, H. (2012). Assessing Country Attractiveness in the Venture Capital and Private Equity Landscape in Emerging Markets. URL: <https://blog.iese.edu/vcpeindex/downloads/> Retrieved on 11.05.2022.

and growing capital markets (Russia to a lesser extent); however the investor protection and entrepreneurial culture are rather poorly developed. Although over the years, BRICS have grown their VC markets, the challenges of the weak institutional environment remain present. In the first quarter of 2022, Chinese VC and PE raised 1.7b USD, a 90% year on year fall and the lowest amount since 2009⁸, as regulators tightened control over the local tech economy. While political environment overshadowed growth prospects in Russia, Securities and Exchange Board of India is expected to introduce stricter IPO norms. As a consequence, there are concerns that the recent growth of VC in EM will not be sustained over the long term, with inflationary environment and monetary tightening putting further pressure on venture valuations.

BRICS present an interesting case in VC context, because despite the impressive growth of VC markets, the industry is far from mature. Considering venture investor landscape in BRICS, we can see that the growth is driven by first-time investors.⁹ While the average lifespan of VC funds worldwide is of 8 to 12 years¹⁰, the fundraising in BRICS has started quite recently.¹¹ At the same time, the exits are shaped by secondary deals, which are transactions of selling the stake in the firm to another fund. The growth phase of start-ups is stretching and exceeds the life of one fund. As a result, VCs in BRICS have not yet observed the whole life of a start-up from the first investment to IPO.

This data shows that the VC decision-making practices are quite infant in BRICS. Many firms have not yet experienced the full VC cycle from fund raising to return of capital to investors. Hence, investors cannot learn from past investments when making decisions in emerging markets. The ability of VCs to deliver a sustainable pipeline of exits and provide returns is essential to raise subsequent funds and to ensure the long-term growth of the industry.

⁸ Financial Times (2022). China Early-Stage Fundraising Slides to Lowest Level Since 2009. <https://www.ft.com/content/7e5528f3-e1d2-4f00-9bc8-a1d703b66175> Retrieved on 16.05.2022.

⁹ Praxis Global Alliance. (2021). India Investments Pulse Report 2021. URL: <https://www.praxisga.com/reports-and-publications/financial-investors-group/report-india-investments-pulse-2021> Retrieved on 16.05.2022.

¹⁰ Pitchbook. (2014). The Venture Capital Lifecycle. URL: <https://pitchbook.com/news/articles/the-venture-capital-lifecycle> Retrieved on 16.05.2022.

¹¹ Data by Crunchbase. URL: <https://www.crunchbase.com> Retrieved on 11.05.2022.

Given the heightened importance of the institutional landscape in the development of VC and lack of experience among venture capitalists in EM, it is important to explore VC decision-making in BRICS, in particular, how institutions can impact the process. The findings may promote a stable capital supply, long-term investment growth and maturity of the VC industry in EM and defy current concerns regarding the unsustainability in these markets.

Theoretical gap. In VC research, institutional theory has been a dominant conceptual framework to explain the drivers of VC market growth at a country level.¹² The emerging markets hold scholars' attention, since despite the rapid development of VC industries the institutional environment in these countries remains weak. Based on the data from emerging markets, studies show that institutional voids impede the growth of VC, and, therefore, innovations in the country.¹³ Along with the country level, the research at the organizational level yields differences in the ways VCs make decisions and manage risks in developing markets.¹⁴

Although multiple studies have established that VCs in EM operate differently from advanced economies¹⁵, theoretical considerations in the field still remain context-free. Applying the agency theory lens, the existing literature suggests the agency problem as the primary factor that shapes VC decision-making process, while the main function of the process is to reduce adverse selection and moral hazard.¹⁶ Current theoretical propositions imply an isolated principal-agent relationship in VC decision-making, assuming a stable institutional environment, which is not present in EM.¹⁷ The interaction of VCs with the

¹² Grilli, L., Latifi, G., & Mrkajic, B. (2019). Institutional Determinants of Venture Capital Activity: An Empirically Driven Literature Review and A Research Agenda. *Journal of Economic Surveys*, 33(4), 1094-1122. <https://doi.org/10.1007/s11187-018-0007-7>

¹³ Dalal, A., & Khoroshunov, O. (2020). Rynok venchurnogo kapitala v Kitaye i Yaponii: Sravnitel'niy analiz [Venture Capital Market in China and Japan: A Comparative Study]. *Asia and Africa Today*, 3, 34-41. <https://doi.org/10.31857/S032150750008729-3>

¹⁴ Klonowski, D. (2007). The Venture Capital Investment Process in Emerging Markets: Evidence from Central and Eastern Europe. *International Journal of Emerging Markets*, 2(4), 361-382. <https://doi.org/10.1108/17468800710824518>

¹⁵ Foo, M.W., Vissa, B., & Wu, B. (2020). Entrepreneurship in Emerging Economies. *Strategic Entrepreneurship Journal*, 14, 289-301. <https://doi.org/10.1002/sej.1363>

¹⁶ Gompers, P. A., Gornall, W., Kaplan, S. N., & Strebulaev, I. A. (2020). How Do Venture Capitalists Make Decisions? *Journal of Financial Economics*, 135(1), 169-190. <https://doi.org/10.1016/j.jfineco.2019.06.011>

¹⁷ Groh, A.P., Liechtenstein, H., Lieser, K. & Biesinger, M. (2021). The Venture Capital and Private Equity Country Attractiveness Index. URL: <https://blog.iese.edu/vcpeindex/downloads/> Retrieved on 11.05.2022.

environment may impose new functions of their decision-making process, which is not reflected in the current models. The existing studies do not provide a theoretical construct which captures the distinctive characteristics of VC management observed in EM. Thus, current theoretical considerations cannot explain the role of institutions in VC management and lack explanatory power in the case of emerging markets.

The goal and objectives of the study. The study aims to answer the research question “How does the VC decision-making adapt to the institutional environment?”. In order to achieve the goal of the research, the study includes various stages that answer a number of smaller questions, such as:

- What are institutional drivers of VC investments across countries?
- Which theories are employed in VC decision-making research?
- How is the process of VC decision-making defined?
- Do institutional factors affect VC decision-making?
- What is the mechanism of the effect at the organisational level?

Answering these questions results in a theoretical framework of VC decision-making in the institutional context, the main finding of the study.

The subject of the study is the decision-making process at VC funds operating in BRICS countries.

The object of the study are VC management practices for funding innovations in BRICS countries.

The empirical unit of the study is a venture fund, which invests in innovation projects domiciled in BRICS, while the respondents, VC fund managers, are the sources of information.

Theoretical background and research methodology. The theoretical basis of the dissertation research is formed by the fundamental and applied works of leading domestic and foreign scholars in the area of entrepreneurial finance and innovation management, alternative asset classes and general organizational theory. Theoretical provisions and conclusions of the dissertation research are based on the results of the analysis of articles in peer-reviewed scientific journals, monographs and dissertations.

To achieve the research goal the mixed method research design is used, which consists of quantitative and qualitative analyses. The first stage is a quantitative study of VC drivers conducted with the meta-analysis techniques. In the meta-analysis we collect statistical data from existing papers and calculate the effect sizes of country variables on VC investments. The study follows PRISMA guidelines on meta-analysis (Moher *et al.*, 2009); 30 primary studies that satisfy eligibility criteria are found in Scopus, Web of Science and Google Scholar databases. The data set yields 840 statistical entries which are collected and analysed using Stata software.

The second stage is a qualitative study which employs grounded theory (GT) approach in order to develop a theoretical framework of VC decision-making in institutional context. Data is triangulated with various data types and sources, including one-hour in-depth interviews, publicly available video interviews and corporate documents. Collected data is transcribed and coded in MAXQDA software, emerging codes are further analysed through theoretical coding until the core categories emerge.

Scientific novelty. The novelty of the research comes in a form of theoretically conceptualizing the role of institutional context in VC decision-making. The results of this study signify the scientific novelty in the areas of entrepreneurial finance and innovations management in four ways.

1. The classification of VC drivers is developed, the mean effect of the country drivers on VC investments is calculated and corrected for heteroskedasticity and publication bias.
2. Theoretical constructs of Institutional Awareness and Decision-Making Agility are formulated, which signify VC management practices in BRICS.
3. The extended model of the VC decision-making process is proposed.
4. A theoretical framework of VC decision-making in an institutional context is developed.

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Results of the study submitted to the defense.

The results of the study may be formulated in four points in accordance with the research novelty.

1. The meta-analysis confirms the significant positive effect of institutional variables on country's VC investments, by drawing on data samples from 30 studies. It shows that effect holds after the correction for publication bias and controlling for characteristics of previous studies.
2. Data-grounded categories of Institutional Awareness and Decision-Making Agility present how institutional variables affect VC decision-making. Institutional Awareness illustrates how the effect of institutions is used to generate inputs for VCs decisions. Decision-Making agility shows how VC managers adjust their decision-making in response to the effect of the institutional environment. Decision-Making Agility includes three practices adopted at VC funds to mitigate the adverse effect of weak institutions on investments, Risk Anticipating, Flexibility Ensuring, Environment Supplementing.
3. The proposed model of the VC decision-making process includes non-investment-related phases, such as Creating Fund I and Creating Fund II, which are overlooked in the existing models. The new phases unfold VC management practices of searching for investors, structuring the fund and developing the investment thesis, which are important in VC investment decisions in BRICS.
4. A theoretical framework of VC decision-making in the institutional context conceptualizes the role of country's institutional development in VC investing. It shows the mechanism of the effect of institutional variables on VC investments, which is

mediated by Institutional Awareness and mitigated by Decision-Making Agility at each stage of the decision-making process.

Theoretical contributions of the study are presented in four points, following the main results of the conducted research.

First, the meta-analysis calculates the effects of formal and informal institutional variables on VC investments yielded from 30 papers on VC (Dalal, 2022). It allows to confirm the significant effect of country's institutional development on VC investments, despite the discrepancies found in the literature. The results of the quantitative review of previous research fill the gap on the lack of clarity regarding the effect of institutions on country's VC (Grilli *et al.*, 2019). By combining 840 observations, including all institutional variables studied previously and controlling features of research design, data samples and metrics used in primary studies, we overcome the compartmentalization of previous quantitative research and speculative choice of variables in order to obtain a robust effect size of country's VC drivers.

Second, the study introduces a theoretical construct of Decision-Making Agility, which is an integrating process that engages the reflection of adaptive capabilities, available resources and an institutional environment. Decision-Making Agility presents how VC decision-making process is adapted to the ambiguity in BRICS markets. The theoretical construct extends on agency theory and resource-based view that are dominant in the investment research area (Fried & Hisrich, 1994; Hsu *et al.*, 2012; Kaplan & Strömberg, 2001; Makarova & Dalal, 2020; Miloud *et al.*, 2012; Sahlman, 1990), contributes to the behavioural perspective emerging in VC field (El Harbi & Toumia, 2020; Johansson *et al.*, 2019; Zheng, 2022) and brings insights from management decision-making and portfolio decision-making to VC context (Intezari & Pauleen, 2018; Kester *et al.*, 2011). The discovery of this construct defies the proposition of the current theory that VC decision-making is made to reduce agency problem (Amit *et al.*, 1998; Gompers *et al.*, 2020; Klonowski, 2007; Monika & Sharma, 2015; Sahlman, 1990; Sievers *et al.*, 2013; Silva, 2004; Sørensen, 2007). Decision-Making Agility illustrates that apart from reducing adverse selection and moral hazard, decision-making of VCs aims to mitigate the adverse effects of the environment.

Third, the study proposes a new model of the VC decision-making process that extends on existing models by including new stages, such as developing VC fund's structure and raising subsequent funds. The existing academic endeavour is focused on the fund's investment process, which we found to be only a part of VC decision-making (Gompers *et al.*, 2020; Kaplan & Strömberg, 2001; Klonowski, 2007; Sørensen, 2007). The existing models of the VC decision-making process focus on stages of principal-agent relationship and are not sufficient to explain the role of the institutional environment. We propose to include non-investment-related phases (Creating Fund I and Creating Fund II) in the VC decision-making process that capture the relationships with the institutional environment, including suppliers of capital (represent financial market institution), regulatory institutions and informal institutions (entrepreneurial culture). While the VC process in previous papers ends with exiting the deal (Gompers *et al.*, 2020; Klonowski, 2007), the study expands this view and examines the raising of subsequent funds, thereby reflecting a multiperiod perspective of the decision-making process and explaining the maturing of VC firms and, hence, the VC industry. This view combines the previous academic research on the emergence of VC market (Bustamante *et al.*, 2021; Lingelbach, 2013) with VC management studies (Gompers *et al.*, 2020; Kaplan & Strömberg, 2001; Klonowski, 2007; Sørensen, 2007), which has not been done in the area of VC, so far.

Fourth, based on the previous results we build a theoretical framework of VC decision-making in an institutional context. The observed grounded constructs (VC Decision-Making Process, Institutional Awareness, Decision-Making Agility) provide novel insights about patterned relationships (Glaser & Strauss, 1967; Shepherd & Suddaby, 2017) and call for data-stimulated theorizing. We problematize the propositions of the agency theory in explaining the VC decision-making process in EM. Our theoretical framework challenges the assumption of isolated principal-agent relationship in a stable environment by introducing the institutional context. The developed framework of VC decision-making in an institutional context illustrates how institutional variables provide inputs for generating decisions and shape the decision-making of VCs. The result offers a theoretical consideration of VC decision-making that accounts for the institutional context, while existing theory in the field remains context-free (Bliss, 1999; Boocock & Woods,

1997; Fried & Hisrich, 1994; Gompers *et al.* 2020; Hall, 1989; Kaplan & Strömberg, 2001; Klonowski, 2007; Silva, 2004; Sørensen, 2007; Tyebjee & Bruno, 1985; Wells, 1974).

Moreover, studies examining the combined effect of formal and informal institutions are rare. Only recently, a few studies have started taking into account the joint effects of formal and informal institutions on VC markets (Bustamante *et al.*, 2021; Grilli *et al.*, 2018; Li & Zahra, 2012). The literature shows that there is a growing need to theorize and improve our understanding of these combined effects (Eesley *et al.*, 2018; Peng *et al.*, 2009; Stenholm *et al.*, 2013), which this study attempts to do.

Additionally, the study provides several methodological contributions. It analyses BRICS countries, which are usually combined according to their institutional development, however the state of VC markets across these countries is very disperse. By applying a constant comparative approach in a grounded theory analysis, we investigate the heterogeneity of venture markets in these countries. Contrasting their institutional environments allows us to get further insights on the context and generalize the concept of VC decision-making. The case of BRICS is particularly interesting because multiple studies have argued that the VC market in EM is different from the developed countries (Ahlstrom & Bruton, 2006; Bradley & Klein, 2016; Foo *et al.*, 2020; Grilli *et al.*, 2018; Zacharakis *et al.*, 2007). The study focuses on the period of up to the year 2021, enabling to capture recent practices. The extant literature, such as studies on the emergence of VC in Russia (Klonowski, 2007; Lingelbach, 2013), covers the period of up to 2010 and provides results on the past stages of the venture capital development. As VC sector is evolving and maturing, previous findings may not adequately reflect the current state of VC management practices.

Finally, this research provides a methodological contribution by combining the meta-analysis on the VC drivers and the GT analysis of the VC decision-making process. It merges two approaches employed in the area, quantitative cross-country regression analysis and qualitative analysis of VC at an organisational level. Thus, the developed research design enables to bring a macro context of an institutional development to organisational and individual levels of making decisions by VC managers, thereby providing a comprehensive multifaceted view to the venture investing.

Practical contributions of the study. The implications of this study are significant as they add greater understanding of the complex nature of decision-making. Using the developed framework of the VC decision-making in an institutional context, governments can develop a targeted policy to eliminate current institutional impediments and foster VC market growth.

Because theorizing in this study is triggered by practice (analysed with GT), it reveals “paradoxes and problems of practical value to managers” (Shepherd & Suddaby, 2017, p. 63). For managers, this framework defines specific capabilities critical for the successful operation of VCs in weak institutional environments. The proposed construct of Decision-Making Agility may be employed by VC managers as a multidimensional practice that deals with uncertainty exacerbated by undeveloped institutions. The theoretical framework unfolds specific activities VCs may undertake in order to mute the adverse affect of weak institutions and matches them to the relevant stage of the VC decision-making process. Thus, it provides recommendations to VC senior staff for operating in EM that can be easily integrated in the firm without any previous experience of venture investing in BRICS. The results of the study contribute to the understanding of VC management in EM and, thus, make BRICS more attractive to foreign venture firms. Moreover, using our multiperiod decision-making process VC firms can enhance the chances of their survival and, as a consequence, foster the maturing of a country’s VC industry.

Approbation of the study results. The findings of the study were presented in a number of scientific conferences and seminars, as listed below:

- Meta-Analysis of Economic Research Network Colloquium (22-23.10.2021, University of Piraeus, Athens, Greece). Presentation “Meta-analysis of determinants of venture capital activity”.
- 20th Annual Conference of the European Academy of Management (4-6.12.2020, online). Presentation “Determinants of venture capital investments across countries: Meta-analysis”.

- III International Science Conference SER 2020 (17-19.09.2020, Economic Laboratory for Transition Research, Podgorica, Montenegro). Presentation “The evaluation of efficiency of corporate inversions”
- PhD Workshop “Financial Markets and Corporate Strategies” (17.04.2021, Higher School of Economics, Moscow, Russia). Presentation “Determinants of venture capital investments across countries: Meta-analysis”.
- 11th EURAM Early Career Colloquium (9-11.03.2020, Huddersfield Business School, Huddersfield, UK). Presentation “Venture capital for funding innovation projects in BRICS countries”.

The study is funded by RFBR, project number 19-310-90085.

Structure of the study. The dissertation consists of an introduction, three chapters, a conclusion, a list of references and eight appendices. The total size of the dissertation is 147 pages. The thesis presents 30 tables and 2 figures. The list of references includes 172 titles, of which 169 are in English.

In the introduction the research problem and a theoretical gap are presented; the purpose and objectives of the study are defined; the main provisions of scientific novelty, theoretical and practical significance are highlighted.

The first chapter of the paper presents a systematic review of the literature and a comparative analysis of country-specific factors of VC market activity. Based on the analysis of the literature, a classification of VC drivers is proposed. Next, the literature on the decision-making process in the VC is analysed; the theoretical background in the area is presented; a comparative analysis of decision-making models is carried out and the features of VC decision-making in developing countries are formulated.

The second chapter of the work is devoted to a quantitative study of institutional drivers of VC, which employs meta-analysis methods. The effect sizes of country specific drivers are calculated. A meta-regression analysis is conducted, which provides statistical data on the reasons for the disparity in the results of previous studies. The main conclusions are given and the role of the meta-analysis findings in the construction of a theoretical model is determined.

The third chapter of the dissertation presents the grounded theory (GT) analysis of the VC decision-making process. The processes of data collection and coding are described, the characteristics and justification of the choice of empirical objects are given. The intermediate results of the study are formulated, such as the model of VC decision-making process and the theoretical constructs of Institutional Awareness and Decision-Making Agility. Using the intermediate results, a theoretical model of VC decision-making in the institutional context is built

In the conclusion, the main findings of the work are summarised; theoretical contributions and practical implications of the results are formulated; limitations of the study are addressed and avenues for the future research are proposed.

II. RESULTS OF THE STUDY SUBMITTED TO THE DEFENSE

1. The meta-analysis confirms the significant positive effect of institutional variables on country's VC investments, by drawing on data samples from 30 studies. It shows that effect holds after the correction for publication bias and controlling for characteristics of previous studies.

As the first stage of this study, we conduct quantitative research that uses meta-analysis techniques. The purpose of the meta-analysis is to calculate the effects of institutional variables on VC investments. It helps to answer the question “What are institutional drivers of VC investments?” in order to proceed with the main research goal.

First, the systematic literature review provides a comparative analysis on the evidence regarding country determinants of the VC market activity. Based on literature analysis, we provide a classification of VC determinants studied before in order to test them in the meta-analysis. The second step is to calculate the “true” effects of country variables on the volume of VC investments. The final objective is to run a meta-regression that provides statistical evidence on the causes of disparities in the findings across existing studies.

As a result, the meta-analysis provides a number of findings. First result are corrected mean effect sizes of each group of variables (Table 1). The second finding are the reasons of disparities in the findings of previous research (Table 2).

The data collection is conducted with PRISMA guidelines in meta-analysis¹⁸ and yields 30 papers included in the final sample. Drawing on 840 observations from 30 studies, the meta-analysis shows the significant positive effect of institutional, technological and macroeconomic variables after correcting for heteroskedasticity and publication bias (Table 1). Technological opportunities show the highest effect on VC activity followed by formal institutions.

¹⁸ Moher, D., Liberati, A., Tetzlaff, J., & Altman, D.G. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *BMJ*, 339(b2535). <https://doi.org/10.1136/bmj.b2535>

Table 1. The VC drivers effect sizes

FAT-PET	OLS	WLS (Precision)	WLS (Estimates)	Obs
<i>All variables</i>				
SE (reporting bias)	-0.204 (0.429)	0.201 (0.479)	-0.757 (0.002)	831
Constant (corrected effect)	0.123 (0.000)	0.089 (0.001)	0.171 (0.000)	
<i>Institutions</i>				
SE (reporting bias)	-0.650 (0.022)	-0.366 (0.326)	-0.866 (0.001)	458
Constant (corrected effect)	0.135 (0.000)	0.110 (0.002)	0.155 (0.000)	
<i>Formal institutions</i>				
SE (reporting bias)	-0.581 (0.016)	-0.271 (0.395)	-0.827 (0.000)	424
Constant (corrected effect)	0.125 (0.000)	0.097 (0.010)	0.150 (0.000)	
<i>Financial market conditions</i>				
SE (reporting bias)	0.121 (0.778)	0.429 (0.341)	-0.238 (0.569)	187
Constant (corrected effect)	0.094 (0.012)	0.067 (0.004)	0.123 (0.001)	
<i>Macroeconomic variables</i>				
SE (reporting bias)	0.479 (0.328)	1.141 (0.023)	0.316 (0.740)	198
Constant (corrected effect)	0.096 (0.035)	0.045 (0.041)	0.130 (0.068)	
<i>Technological opportunities</i>				
SE (reporting bias)	0.550 (0.126)	0.822 (0.057)	0.881 (0.188)	138
Constant (corrected effect)	0.140 (0.001)	0.116 (0.005)	0.089 (0.120)	

Source: developed by the author in Stata.

Notes: p -values are indicated in the brackets.

The final objective is to explore what drives the disparity in results of previous studies by testing the characteristics of the articles with a meta-regression (see Table 2).

Table 2. Meta-regression analysis

	REML	<i>p</i> -value	CI	
<i>Sample characteristics</i>				
Panel	-0.015	0.751	-0.110	0.079
Time dummy	-0.086	0.000	-0.128	-0.045
EVCA	-0.173	0.000	-0.237	-0.108
TR	-0.115	0.001	-0.185	-0.044
Developed	-0.001	0.980	-0.060	0.059
<i>Model characteristics</i>				
GLS	0.113	0.020	0.018	0.207
OLS	0.054	0.148	-0.019	0.126
FE	-0.020	0.559	-0.086	0.047
RE	0.015	0.652	-0.051	0.081
IV	0.007	0.886	-0.085	0.098
<i>Dependent Variable characteristics</i>				
Scaled	-0.026	0.231	-0.069	0.017
VC investments	0.088	0.338	-0.092	0.268
VC funds raised	0.055	0.561	-0.130	0.240
early-stage VC	0.104	0.262	-0.078	0.286
late-stage VC	0.170	0.138	-0.055	0.395
<i>VC driver characteristics</i>				
Fiscal	0.043	0.288	-0.036	0.123
Labour	0.057	0.278	-0.046	0.160
Other regulatory	0.054	0.189	-0.027	0.135
Government	0.142	0.000	0.063	0.221
Fin. Market	0.139	0.000	0.069	0.208
Informal	0.172	0.000	0.082	0.262
Tech	0.205	0.000	0.133	0.278
GDP	0.144	0.000	0.074	0.214
Trade	0.143	0.006	0.041	0.246
constant	0.079	0.469	-0.135	0.294

Source: developed by the author in Stata.

The analysis yields some unexpected results, such as no impact of the country sample (developed vs. developing) and VC investment stage on the effect of institutions, despite the suggestion of heterogeneity among VC investors in the previous literature.¹⁹ It highlights the effect of institutional environment regardless the type or geography of an investor. Furthermore, the findings empirically confirm the cyclical nature of VC industry and poor quality of data in developing countries, previously suggested in the field.²⁰

Results of meta-analysis establish the significant effect of institutions on venture financing, which could not be obtained by the literature review alone. These findings form the main assumption on the role of institutions in investment decisions of VCs, which we use in developing a theoretical model.

2. Data-grounded categories of Institutional Awareness and Decision-Making Agility present how institutional variables affect VC decision-making. Institutional Awareness illustrates how the effect of institutions is used to generate inputs for VCs decisions. Decision-Making agility shows how VC managers adjust their decision-making in response to the effect of the institutional environment. Decision-Making Agility includes three practices adopted at VC funds to mitigate the adverse effect of weak institutions on investments, Risk Anticipating, Flexibility Ensuring, Environment Supplementing.

The second stage of the study is a grounded theory (GT) analysis of decision-making at venture funds operating in BRICS. GT approach allows to discover three data-driven categories that will become building blocks of a theoretical framework: (1) Institutional Awareness, (2) Decision-Making Agility, (3) VC Decision-Making Process.

Institutional Awareness shows how managers recognise the challenges of institutional environment and transform it into inputs for generating decisions. The conceptual codes of this category empirically confirm the effect of informal institutions on

¹⁹ Grilli, L., Latifi, G., & Mrkajic, B. (2019). Institutional Determinants of Venture Capital Activity: An Empirically Driven Literature Review and A Research Agenda. *Journal of Economic Surveys*, 33(4), 1094-1122. <https://doi.org/10.1111/joes.12319>

²⁰ Drover, W., Busenitz, L., Matusik, S., Townsend, D., Anglin, A., & Dushnitsky, G. (2017). A Review and Road Map of Entrepreneurial Equity Financing Research: Venture Capital, Corporate Venture Capital, Angel Investment, Crowdfunding, and Accelerators. *Journal of Management*, 43(6), 1820-1853. <https://doi.org/10.1177/0149206317690584>

VC investments mediated by the supply of entrepreneurs in the market, proposed in theoretical framework by Bustamante *et al.* (2021).²¹

Decision-Making Agility represents a set of activities that VCs take up as distinct responses to institutional environment. The activities are combined in three categories, Risk Anticipating, Flexibility Ensuring and Environment Supplementing (Table 3). Moreover, in BRICS, we found that the practices VC managers use to mitigate the effect of institutions vary across the stages of VC decision-making process. The proposed analysis matches the activities of Decision-Making Agility to the relevant stage of VC decision-making process.

The sub-core category of Risk Anticipating is the extent to which the environmental factors and behaviours of all stakeholders are integrated in the decision-making process. A weak institutional environment increases the uncertainty VCs have to deal with. Data analysis shows that VCs anticipate potential risks that they may face in the post-investment performance of a project and attempt to reduce them in the pre-investment decisions. VCs deal with potential risks in three ways, represented by conceptual categories: (1) avoiding potential risks, (2) controlling potential risks and (3) managing potential risks.

Not all risks of investment decisions can be anticipated. For this reason, VCs exhibit Flexibility Ensuring of resources in order to react promptly to changing environment, if necessary. To achieve overall agility of the decision-making process, VCs ensure internal flexibility and require flexibility of the projects they invest in.

The sub-core category Environment Supplementing shows how VCs take a role of supplementing missing elements of VC infrastructure and providing missing knowledge to market players. Environment Supplementing extends on the current view of the role of VCs in the market as solely a minimisation of the agency problem.

²¹ Bustamante, C.V., Mingo, S., & Matusik, S. F. (2021). Institutions and Venture Capital Market Creation: The Case of An Emerging Market. *Journal of Business Research*, 127, 1-12. <https://doi.org/10.1016/j.jbusres.2021.01.008>

Table 3. Developing the category of Decision-Making Agility

Core category	Sub-core categories	Conceptual categories	Conceptual codes
Decision-Making Agility	Risk Anticipating	Avoiding potential risks	Avoiding high-risk innovations, Avoiding pre-revenue projects
		Controlling potential risks	Specifying term sheet
		Managing potential risks	Positioning projects for a trade sale
	Flexibility Ensuring	Internal flexibility	Flexible VC structure, Flexible investment thesis
		External flexibility	Requiring versatility
	Environment Supplementing	Building an infrastructure	Creating own network, Building reputation, Introducing principles of networking
	Providing knowledge	Building VC awareness, Supplementing business skills	

Source: developed by the author.

3. The proposed model of the VC decision-making process includes non-investment-related phases, such as Creating Fund I and Creating Fund II, which are overlooked in the existing models. The new phases unfold VC management practices of searching for investors, structuring the fund and developing the investment thesis, which are important in VC investment decisions in BRICS.

The model of VC decision-making process (Table 4) captures all stages of the process observed in BRICS. The analysis of emerging markets shows insufficient understanding of the phases of VC decision-making process in the previous literature. Our model includes non-investment related stages that are found to influence the investment decisions, yet they have not been included in the previous models. The Creation Fund I phase is vital in order to understand the role of investors (LPs) in the whole VC decision-making process in EM. Moreover, this phase includes the stage of developing investment thesis that is further applied to screening and due diligence in making investment decisions.

The new phase of raising subsequent funds (Creation Fund II) captures a multiperiod perspective of managers decision-making as a mean of survivability of VC firms. Firms that can raise subsequent funds represent more mature markets, thus, our model helps to gain knowledge of the process of the industry maturing in BRICS.

Table 4. VC decision-making process

Gompers <i>et al.</i> (2020)	Developed by the author	
	Searching for investors	
	Fund structuring	Creating Fund I
	Developing investment thesis	
Deal sourcing	Deal origination	
Initial screening by the originator	Initial screening outside VC fund	
Meeting	Screening by VC fund	Pre-investment decisions
Review		
Formal due diligence	Due diligence	
Structuring	Deal structuring	
	Closing	Investment decision
Post-investment monitoring and advising	Value-adding	Post-investment decisions
Exit	Exit	
	Searching for LPs	
	Fund structuring	Creating Fund II
	Developing investment thesis	
	Source: developed by the author. ²²	

²² Based on Gompers, P. A., Gornall, W., Kaplan, S. N., & Strebulaev, I. A. (2020). How Do Venture Capitalists Make Decisions? *Journal of Financial Economics*, 135(1), 169-190. <https://doi.org/10.1016/j.jfineco.2019.06.011>

4. A theoretical framework of VC decision-making in the institutional context conceptualizes the role of country's institutional development in VC investing. It shows how the effect of institutional variables on VC investments is mediated by Institutional Awareness and mitigated by Decision-Making Agility at each stage of the decision-making process.

The final step involves theory building in order to provide a framework of VC decision-making in the institutional context (Figure 1). In the framework, country's institutional variables affect the environment VCs operate in, VC managers' awareness of the external environment forms inputs for generating decisions at each stage of the decision-making process. Since the awareness of the changing environment is an internal capability of a VC manager, inputs for generating decisions are placed inside the VC decision-making process. To mitigate the effect of inputs on the outcome of the decision-making process, VC funds can employ activities which comprise the elements of Decision-Making Agility. Decision-Making Agility is a practice that VC managers choose to employ rather than a given variable. VC investments are the output of the VC decision-making process.

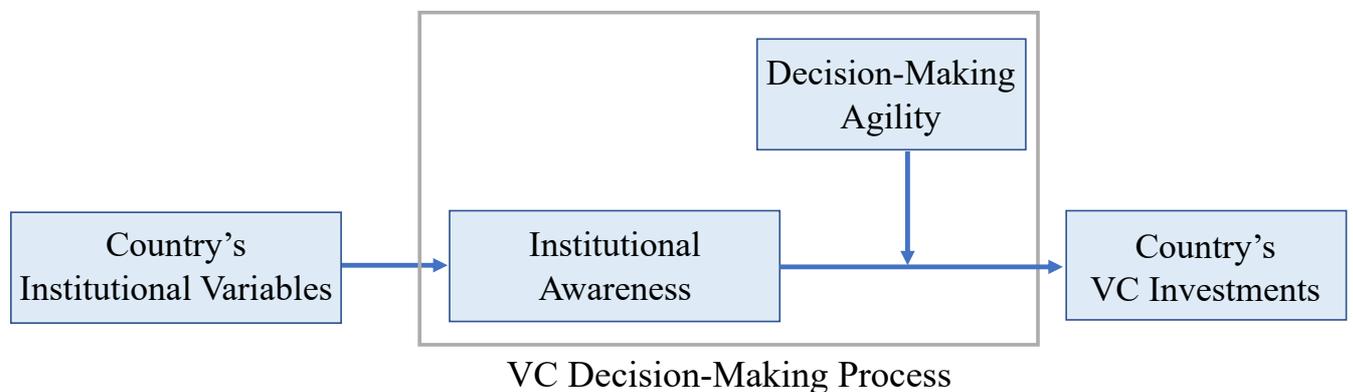


Figure 1. The framework of VC decision-making in an institutional context
Source: developed by the author.

The data in BRICS suggests that existing research does not fully explain the role of institutions in decision-making of VC firms. Based on the analysis of BRICS, we argue that the impact of institutions on VC investments is affected by the abilities of VC managers to recognise the ambiguity of the weak institutional environment (Institutional Awareness) and to adapt decision-making around it (Decision-Making Agility).

The theoretical framework overcomes the compartmentalization characteristic of prior research. Although previous studies provide a statistical association between institutional variables and venture investments, they do not capture how the effect is transmitted on a microlevel. On the other hand, qualitative studies that examine VC decisions usually do not account for an institutional context. Despite the emphasis that empirical studies place on the role of institutions in a VC market, existing studies do not provide the theoretical premise for understanding how they relate to VC practices. The significant effect of the institutions that is established by the meta-analysis is de-segmented in the proposed framework. Activities taken by the VCs as a reaction to the observed inputs are conceptualised in a theoretical construct of Decision-Making Agility.

III. MAIN FINDINGS OF THE STUDY

The study investigates the role of institutions in VC and conceptualises VC decision-making in emerging markets. The results contribute to the literature, first, by showing how the observed country-level effect of institutional variables on VC investments is transitioned at the organizational level of a venture firm, and second, by providing the institutional context to the decision-making theory in VC. Thus, the research answers the questions of country-level and firm-level studies and provides a comprehensive view of the role of institutions in VC.

The research is conducted in two stages, combining quantitative and qualitative methods, in order to achieve the goal of developing the framework of VC decision-making in the institutional context. The study yields several important results that contribute to the theoretical considerations in the area of entrepreneurial finance and offer practical implications for involved parties.

1. This study provides an extensive analysis of country determinants of the VC market activity. It covers all VC drivers that have been analysed before and systematises the empirical evidence on the determinants of VC investment by conducting a meta-analysis. The meta-analysis draws from the combined samples of 30 studies and calculates the unbiased effect sizes of institutional variables. It shows the positive effect of the formal and informal institutions, technological opportunities and macroeconomic variables on the volume of VC investments in a country, thereby providing a clarity on the VC drivers across countries, that has not been obtained in the area, so far.

2. The study proposes a construct of Decision-Making Agility. It brings together an institutional perspective and specific management practices at organizational level, thereby providing a unified practical understanding of the institutional context in VC decision-making. It shows that the process takes the function of mitigating the adverse effect of weak institutions, extending the existing theories.

3. We extend the model of the VC decision-making process that before has been limited to investment-related decisions. While existing theory investigates the process starting from the deal origination, we believe it is crucial to examine non-investment

stages. The GT analysis of VC practices in BRICS helps to go beyond the existing knowledge on the VC decision-making by exploring the institutional context. The findings show that the decisions made at non-investment-related stages shape the investment choices and determine the success of VC funds, which has not been formally reflected in the previous models.

4. The theoretical model conceptualises the relationship between institutional variables and VC investments. The existing understanding has been limited to the evidence on the statistical association between these variables. The presented framework shows how the effect of institutions is transmitted at the organizational level at VC funds. VC decision-making in the institutional context challenges the assumptions of the current theory on the isolated principal-agent relationship in a stable environment as the main factor that shapes the process.

IV. PUBLICATIONS OF THE STUDY RESULTS

The results of the dissertation research are presented in three papers, two of which are published in academic journals indexed in Scopus, and one study can be found in a journal included in the list of eligible journals provided by Higher School of Economics. The combined size of publications is 3.54 printed sheets, while the author's contribution is 2.61 printed sheets.

A. Publications in journals indexed in Scopus:

1. Dalal, A. (2022). Meta-Analysis of Determinants of Venture Capital Activity. *Entrepreneurial Business and Economics Review*, 10(1), 113-128. <https://doi.org/10.15678/EBER.2022.100108> – 1.49 p.s. (Q2, 2021, SJR²³)
2. Makarova, V. A., Dalal A. (2020). Change in a Stakeholder Utility Function During Crisis. *Montenegrin Journal of Economics*, 16(4), 17-27. <https://doi.org/10.14254/1800-5845/2020.16-4.2> – 1.04 p.s. (Q2, 2020, SJR²⁴)

B. Publications in journals included in the list of eligible journals provided by Higher School of Economics:

1. Dalal, A., Khoroshunov, A. (2020). Venture Capital Market in China and Japan: A Comparative Study. *Asia and Africa Today*, 3, 34-41. <https://doi.org/10.31857/S032150750008729-3> – 1.01 p.s.

²³ Data by Scimago Journal & Country Rank. URL: <https://www.scimagojr.com/journalsearch.php?q=21100857389&tip=sid&clean=0> Retrieved on 01.06.2022.

²⁴ Data by Scimago Journal & Country Rank. URL: <https://www.scimagojr.com/journalsearch.php?q=21100854712&tip=sid&clean=0> Retrieved on 01.06.2022.