How do regulatory frameworks for bank loan financing and P2P financing impact SME's financial accessibility?

Author: Incecinar Can
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT,
While bank loans remain the traditional option for small and medium enterprises, peer-to-peer lending provides access to capital from disperse investors. National regulatory frameworks shape investor confidence, reduce information asymmetries, and influence the expansion of both traditional and alternative finance. Drawing on a panel of 125 countries from 2014-2018, this study shows that favorable regulations, robust creditor rights and deeper information systems, along with dedicated crowdfunding laws, and regulatory sandboxes, improve SME accessibility to finance.

Graduation Committee members:
Xiaohong Huang
Weritz Pauline

Keywords
Institutional Theory, SME finance, P2P lending, Traditional financing, Regulations, Laws

1. INTRODUCTION

1.1 Topic Introduction

Small and medium-sized enterprises (SME) are widely recognized as the core part for economic growth, innovation, and job creation across both developed and emerging economies (Wennekers & Thurik, 1999; European Commission, 2015). The growth of SME's worldwide largely depends on their access to external financing, especially where internal funding is limited. Traditionally, bank loans provided the primary global source of securing capital for firms. However, recently, the emergence of alternative finance, particularly peer-to-peer lending (P2P), provides a new innovative method of funding. Both financing

methods are governed by regulatory frameworks that either facilitate or hinder SME's access to finance. Studies have shown that differences in legal origin, creditor rights, and the overall institutional environment significantly shape the structure and depth of financial markets (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997, 1998; Demirgüç-Kunt & Maksimovic, 1998; Rajan & Zingales, 1998).

Furthermore, stronger investor protections and more efficient regulatory enforcement tend to have larger and broader capital markets, allowing greater access to external financing. (La Porta et al., 1997). At the same time, burdensome regulations or weak regulatory environments can increase the cost of financing and restrict the accessibility of acquiring credit for small firms (Beck & Levine, 2002). Regulatory frameworks have an impact on shaping the financing opportunities. Differences in the legal system and the investors' protection across countries are key factors in the accessibility and the cost of financing (La Porta et al. 1997, 1998). The benefits of supportive regulatory frameworks and investor protections have recently been observed to foster higher participation in crowdfunding markets (Hoque, 2024). Furthermore, Demirgüç-Kunt and Maksimovic (1998) highlight that regulatory requirements, intended to provide financial stability, can rather increase the cost of financing and the accessibility for acquiring capital for SME. The aforementioned insights are exemplified by various national regulatory reforms that have influenced SME financial outcomes. The JOBS Act (Jumpstart Our Business Startups Act), more precisely Title 3, regulation crowdfunding, which was signed into law in 2012, significantly impacted the access to and the size of the investor pool, while also imposing certain disclosures and protection requirements (Hornuf & Schwienbacher, 2017). In 2015 Germany signed the Small Investors Protection Act, which tries to balance investors protection and the market growth, by imposing regulations for non-accredited investors, clear disclosure obligations, and processes for platforms, which in turn provided the basis for the crowdfunding market and it's development in Germany (Hornuf & Schwienbacher, 2017). Furthermore, the UK Financial Conduct Authority introduced in 2014 a sturdy framework for regulating peer-to-peer and equity-based crowdfunding platforms. This act facilitated the growth of crowdfunding, making the UK one of the largest markets globally (Rau, 2020). Similarly, Mexico's Fintech Law and Malaysia's Equity Crowdfunding Framework have had similar results after the implementation of transparent and protective frameworks for investors (Wardrop et al., 2020). In comparison, areas with a lack of these regulatory frameworks, observed in Asia and Latin America, often showed limited access to credit and a slow market growth for crowdfunding (Wardrop et al., 2020; Rau, 2020). These examples underscore how supportive dual frameworks can expand SME financing options, whereas gaps in the regulatory environment may stifle both traditional and alternative finance.

1.2 Research Question

This study aims to answer the following research questions: "How do regulatory frameworks for bank loan financing and alternative financing impact SME's financial accessibility ?" To answer the main question, the study breaks down the research question into the following sub-questions:

1) How do the regulatory frameworks governing bank loan financing affect the accessibility to obtain credit for SME's?
2) How does the regulatory framework governing peer-to-peer lending affect the level of funding obtained by SME's?
3) Do SMEs face fewer financing constraints in countries that have dedicated peer-to-peer lending laws, compared to countries without these laws (considering all countries already have one form or another of bank financing regulations)?

1.3 Relevance of Study

This research bridges the gap between two different areas of study, the traditional perspective on bank finance and the newer literature on alternative finance, to provide a holistic understanding of SME's financing. While studies have examined the effects of the legal environment on traditional finance (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997, 1998; Demirgüç-Kunt & Maksimovic, 1998) and how peer-to-peer lending is affected by various regulations (Belleflamme, Lambert, & Schwienbacher, 2014; Hoque, 2024), fewer studies focus on both approaches simultaneously (Hamarat & Broby, 2022; Hornuf & Schwienbacher, 2017). This study aims to fill the gap in the literature by analysing whether current regulatory frameworks are indicative of a better environment for fostering crowdfunding activity. Furthermore, the study will also analyse whether the introduction of specific regulatory frameworks, such as regulatory sandboxes, investor protection mandates, and bespoke legislation, impacts SME access to finance. This dual analysis will provide insights into whether alternative financing can be a substitute or a complement for the traditional financing for SME's under various regulatory policies.

SME's worldwide report access to finance as a major obstacle for growth, especially in low-income economies, where 40% of SME's mention financial constraints as a roadblock, the rate being twice as high compared to big firms (Karsaclian et al., 2025). Examining how regulatory policies translate into more accessible credit or more volume of funding done through peer-to-peer lending can guide reforms for SME's to promote growth and financial inclusion. Finally, this study will contribute to the academic literature by testing institutional, agency, and signalling theories in a data-driven context.

2. LITERATURE REVIEW

2.1 Forms of Crowdfunding

The types of crowdfunding available as of the time of this publication are the following: Donation-based crowdfunding, reward-based crowdfunding, equity-based crowdfunding, and debt-based crowdfunding (Shneor, R. 2020). This study focuses on debt-based crowdfunding. Debt-based crowdfunding, or often referred to as peer-to-peer lending, enables SME's to borrow money from a larger pool of investors rather than a single bank, following the legal procedures and receiving the money as a loan that the company will have to repay with interest. ("The Information Value of Online Social Networks: Lessons From Peer-to-peer Lending," n.d.)

2.2 Bank Loans vs. P2P Lending

Traditionally, bank loans have been the primary source of external financing for SME's. Many firms still struggle to access these loans because of the requirements regarding creditworthiness, high collateral, and bureaucratic processes (Beck & Demirgüç-Kunt, 2006; Demirgüç-Kunt & Maksimovic, 1998). Peer-to-peer lending provides, in contrast, a decentralized, digital alternative that provides SME's the opportunity to connect directly with investors, having fewer requirements and providing faster access to financial services (Lin, Prabhala, & Viswanathan, 2013). While bank loans rely heavily on financial documentation and institutional relationships, P2P platforms use new assessment models to score borrower risk, which in turn allows greater inclusion of firms (Freedman & Jin, 2017). Although interest raters on P2P loans might be higher than those provided by banks, the accessibility makes them a viable option for SME that face barriers in obtaining a traditional bank loan (Cumming & Zhang, 2019). Furthermore, it can be assumed that P2P lending is not a substitute for bank finance, but rather serves as a complementary solution, particularly when regulations are supportive and bank loan access is limited.

2.3 Regulations and SME access to external finance

Foundational research by La Porta et al. (1997, 1998) shows evidence that stronger legal protection for investors and creditors leads to greater availability of external finance for firms. La Porta et al (1998) further reinforce the claim that countries with high-quality institutions have significantly larger and more accessible capital markets. This research supports the institutional theory view as the results show that a supportive regulatory environment gives investors confidence and safety, improving SME's accessibility to external finance. Expanding on this, Djankov, McLiesh, and Shleifer (2007) confirm their claims through an increase in sample size, furthermore reinforcing the claim that stronger creditor rights and comprehensive information systems are associated with greater private credit volumes. These results showcase a causal relationship between supportive regulatory frameworks and financial accessibility.

Demirgüç-Kunt & Maksimovic (1998) concluded that in countries with a supportive legal environment, firms are not only accessing financial aid more easily but also growing faster. Furthermore, the research highlights that regulatory requirements, intended to provide financial stability, can rather increase the cost of financing and the accessibility for acquiring capital for SME's. Supporting this concern, Beck and Demirgüç-Kunt (2006) identify that for SME, access to finance is one of the biggest constraints on their growth worldwide, especially in countries with weaker institutions. The authors argue that policies like credit guarantee schemes and information infrastructure can help offset some of the regulatory burdens that SME's are facing.

Recent evidence from emerging markets supports these conclusions. Fouejieu, Ndoye, and Sydorenko (2020) show that a stable macroeconomic environment and strong institutions, specifically effective credit bureaus, robust legal frameworks, and strong regulatory capacity, are correlated with higher SME access to bank finance. Furthermore, when bank loan regulations become overly restrictive, traditional bank lending to SMEs can decline. Hamarat & Broby (2022) explore this by analysing the U.S. Dodd-Frank Act, which tightened bank lending standards after 2010. It studies how banks reduced their lending to small businesses when compared with P2P platforms, which did not fall under the same restrictions. This study implies that heavy bank regulations constrained the SME's funding supply, while P2P lenders gain popularity. The findings show how regulations can impact bank loans, and at the same time, the opportunities that arise with alternative financing methods.

2.4 Regulations and SME access to P2P lending

Peer-to-peer lending has developed as a viable financing option for SME's. Multiple studies have shown that clear, supportive, and well-defined regulatory frameworks play an important role in increasing participation in alternative financial markets. As the P2P market is further developing, the importance of well-defined regulatory frameworks becomes more and more necessary for both firms and investors.

Belleflamme, Lambert & Schwienbacher (2014) discuss the need for clear regulatory frameworks as the market grows. They support the idea that clear regulatory guidelines are required in order to increase SME's participation in debt crowdfunding markets. Furthermore, claiming that well-defined rules promote a safe environment for both firms and investors, which serves as a positive signal in increasing the crowdfunding activity for the SME's. Similarly, Hornuf & Schwienbacher (2017) provide cross-country evidence that shows that there is an optimal level in crowdfunding when considering investor protection. To be more precise, the author argues that overly strict regulations may unintentionally hinder small firms' ability to acquire capital, contradicting the traditional assumption that more protection is more beneficial. By examining regulatory environments in various countries, Hornuf and Schwienbacher (2017) claim that countries that moderately lower disclosure or registration burdens, while at the same time protecting investor rights, tend to foster larger crowdfunding markets.

Expanding on these findings, Rau (2020) analyzes a dataset covering over 152 countries, in which the author investigates the differences in crowdfunding volume between developed and emerging economies. The author claims that explicit crowdfunding regulations significantly increase the volume of crowdfunding, with evidence showing a causal effect. It was observed that in countries that implemented clear rules for P2P lending, the markets showed a significant increase in market growth than countries without such frameworks. Furthermore, Rau claims that better governance (control of corruption, regulatory quality) results in higher alternative finance volume, especially in emerging markets.

Regulatory Surveys and Reports: Industry reports further support the aforementioned academic findings. Cambridge Center for Alternative Finance (2019) conducted a regulatory survey in which it was observed that the early adopters of a supportive regulatory environment, such as Malaysia for equity crowdfunding, have seen a steady growth in alternative finance, providing new opportunities for SME's that lacked funding access. Similarly, the OECD and World Bank have reported that

fragmented or unclear policies were holding down crowdfunding in several emerging economies. The new European Union Crowdfunding Regulation (2021) intends to standardize crowdfunding to stimulate cross-border funding. These insights reinforce our argument that the regulatory framework of a country has a direct impact on external financing.

2.5 Theoretical Framework

This study bases its empirical analysis on three main theoretical perspectives: institutional theory, agency theory, and signaling theory, to explain why regulatory frameworks might impact SME financing through banks and peer-to-peer lending.

2.5.1 Institutional Theory

Institutional Theory supports the idea that rules, norms, regulations, and governance structures in a society have an impact on shaping the behavior of firms and individuals. Regarding finance, formal institutions like laws and regulations create the environment in which transactions occur (Hoque, 2024). One of the central ideas of this theory supports that well-designed institutions that reduce uncertainty and transaction costs, facilitate economic exchanges and credit provision. Strong legal protections for creditors and investors provide lenders the opportunity to extend their funds, providing an increase in credit availability (La Porta et al., 1998). By contrast, weak legal enforcement, unclear regulations might hinder SME access to finance, as lenders pull back in the face of increased risks or compliance costs (interest rates, collateral) (Djankov et al., 2007). In this study, this theory supports the idea that countries with a robust legal framework will show higher SME access to finance. This theory leads us to expect that stronger legal protections and clearer rules will be associated with more SME access to finance.

2.5.2 Agency Theory

Agency Theory explores the relationship between principals and agents when information is imperfect and their interests collide (Jensen & Meckling, 1976). Two main problems are identified: 1)adverse selection, withheld information before a transaction (Akerlof, 1970); 2)moral hazard, hidden actions after acquiring funding (Jensen & Meckling, 1976). SME's face difficulty acquiring loans as the agent poses a risk of diverting funds or overreaching, since the agent holds more information about the business and might not fully bear the consequences. Peer-to-peer lending further complicates things as the principal is not an institutional body, and is composed of tens or hundreds of individuals with limited ability to monitor the agent. Agency theory supports the idea that mechanisms that align incentives or reduce information asymmetry prove crucial for mitigating these problems (Jensen & Meckling, 1976). Regulations can serve as the mechanism that requires information disclosure, sets rules and standards, protects investor rights, and reduces the risk to lenders. This theory leads us to expect that regulatory measures that reduce information gaps and protect investors could improve the participation of SME in lending.

2.5.3 Signaling Theory

Signaling Theory pairs with agency theory, focusing on the information gap between parties, and how that gap can be bridged through credible signals (Spence, 1973; Connelly et al., 2010). SME can attempt to signal their quality to lenders through credit ratings, collateral, past performance, or other indicators. However, in peer-to-peer lending, investors are often non-experts, thus signals become more important (Ahlers et al., 2015). Supportive regulatory environments can act as signals themselves; clear and well-enforced peer-to-peer lending regulations can signal to investors that the market is transparent and safe, thus increasing their participation (Belleflamme et al., 2014). Henceforth, peer-to-peer lending laws or investor protections can increase trust and participation in the market, indirectly impacting SME access to funding.

2.6 Hypotheses

Based on the supporting literature and the aim of this study, the following hypotheses have been formulated:

H1: Stronger traditional finance regulatory environments that protect investors and lower bureaucratic burden are positively associated with SME access to bank financing. Countries with laws that protect lenders(stronger legal rights, good credit information systems) and business regulations should reflect a higher percentage of SME obtaining bank loans or lines of credit. This hypothesis is grounded in institutional theory and prior findings that better legal environments improve credit access (La Porta et al., 1998; Djankov et al., 2007).

H2: The presence of supportive regulatory frameworks for crowdfunding has a positive impact on the volume of capital raised for SME through alternative financing. We expect that the presence of dedicated peer-to-peer laws that are clear and supportive will correlate with an increase in peer-to-peer lending volume per capita for SME. This hypothesis supports that explicit peer-to-peer regulations foster market growth (Hornuf & Schwienbacher, 2017; Rau, 2020) and reflects the idea that reducing uncertainty for investors with regulations can increase participation in the peer-to-peer lending markets.

H3: SME's in countries with a dedicated peer-to-peer lending law face fewer financing constraints than SME in countries without such laws, assuming that all countries in our sample have some form of bank financing regulation. To be more explicit, if a country has enacted a specific law for peer-to-peer lending, it is expected that a lower percentage of SME in the selected country cite access to finance as a major obstacle to their operations. This hypothesis is grounded in the notion that alternative finance serves as a complementary founding source, thus when SME struggles with traditional bank financing, the percent of regulated peer-to-peer channels could alleviate the credit constraints (Hamarat & Broby, 2022; Cumming & Zhang, 2019).

3. METHODOLOGY AND DATA

3.1 Research Design

The three types of research design are qualitative, quantitative, and mixed (Creswell 2009). This study uses a quantitative approach to test the hypothesis by examining the relationship between variables, through hypothesis testing that will conclude the acceptance or rejection of the proposed hypothesis (Creswell, 2009). This method was chosen as it works with numerical data in order to provide exact insights into the differences that the regulatory frameworks can make. The results will be tested against previous research for further validation.

To investigate the impact of regulatory frameworks on SME's financing, the analysis will be done on 125 countries across both developed and emerging economies. Each country from the list (see Appendix A) will represent a unit of analysis with its set of indicators for SME's financing and regulations. The timeframe of the study is 2014-2018; the reasoning for the choice is that the era before COVID-19 will ensure that the observations reflect normal market conditions unaffected by the pandemic disruptions.

3.2 Sampling

Studying the entire population would be the ideal case for this study; instead, due to the size and diversity of the data, the study will be based on a sample *(Acharya et al., 2013).* As of now, there are 193 UN countries and 2 observer countries (United Nations. Dag Hammarskjöld Library, n.d.-b). The sample used for this research includes 125 countries. The selection is done non-randomly, selecting countries that 1)participated in the World Bank Enterprise Survey to ensure reliable indicators for SME's access to credit and 2) the volume of P2P lending was reported by the Cambridge Centre for Alternative Finance in the annual report for P2P volumes. Sampling purposely allows the study to focus on units of analysis that have the most complete and comparable data, even if that hinders the direct calculation of sampling error (Palinkas et al., 2015; Ziegler et al., 2023).

To mitigate some of the sample bias, we ensure that the sample represents different regions and income levels from both emerging and developed economies. The sample includes countries from all major world regions and follows World Bank income classifications, while also noting legal origin (common law and civil law). This approach mirrors previous cross-country financial studies (La Porta et al., 1998; World Bank, 2024). This study does not cover smaller or less-developed economies, resulting in a bias towards better data environments, which represent a common problem in purposive design (Creswell, 2014). As additional rounds of the World Bank Enterprise Survey and more countries start reporting their P2P lending volume, this study could be extended towards the entire population, currently covering only 64.1% of the true population.

3.3 Variables

Figure 1 in the Appendix: Variable Table includes all the variables used for this study, their type, definition, measurement, and previous researchers who have used the same measurement. The variables were classified in three main categories: dependent, independent, and control, which are defined and explained in detail below:

Dependent variables (D): This study analyses three key outcome measures for SME financing: 1) SME bank loan access (LoanAccess) – represents the percentage of SME with a bank loan or line of credit. This variable is used to measure how many firms successfully obtain access to traditional bank finance and is our primary measure for testing hypothesis 1, where a higher value means more SME obtained through traditional financing. 2) P2P lending volume per capita(P2P_vol) – measures the total volume of peer-to-peer lending in a country (US dollars per capita). This variable captures how much funding SME raise via peer-to-peer lending platforms. P2P_vol is the key outcome for hypothesis 2, where higher values indicate a larger flow of funds towards SME. 3) SME Financing Constraint (FinConstraint) – represents the percentage of firms identifying access to finance as a major obstacle for their operations. This variable measures the perceived credit constraints, where a higher value represents more firms that are credit-constrained. FinConstraint is used to assess the overall difficulty in obtaining finance in hypothesis 3.

Independent variables (I): For this study, we construct composite indices to quantify different dimensions of financial regulations: 1)Regulation burden for credit (RB_credit) – this index captures the strengths(or weaknesses) of legal protections in the credit market at the country level. It is composed of two indicators from the World Bank's Doing Business dataset, namely: a)the strength of legal rights index, which measures the degree to which laws protect the rights of borrowers and lenders. The index is noted on a scale from 0-12, with 0 representing the weakest legal protection and 12 the strongest legal protection for creditors and borrowers. b) Depth of credit information index (Depth_credit), measures the scope, accessibility, and quality of credit information available. Is it measured on a scale from 0-8, with 0 representing poor credit information infrastructure and 8 representing comprehensive, accessible, and high-quality credit information infrastructure. 2) Crowdfunding regulatory index (CRIndex), this composite index measures the support of a country's regulatory framework for peer-to-peer lending. It is calculated by summing three components: a) the existence of a dedicated peer-to-peer law(1 represents yes, 0 if no) b) a regulatory stringency score (regulatory_law) (ordinal 0–2, where 0 = no specific laws, 1 = enabling laws, 2 = restrictive laws), and c) the presence of a regulatory sandbox for fintech (1 if the country has a fintech/crowdfunding sandbox, 0 otherwise). The index ranges from 0 to 4, with higher values indicating a more developed and supportive regime for peer-to-peer lending.

Control variables (C): The study includes several control factors that account for other differences across countries that could affect SME financing access: 1) Economic development – represented by GDP per capita(log(GDP)), controlling for the level of economic development of a country. It is assumed that richer economies tend to have more developed financial systems, which could in turn provide better SME access to finance. 2)Financial Depth (FinDepth) – represented by domestic credit to the private sector as a percentage of GDP, this controls the depth of the financial sector. A higher credit-to-GDP ratio indicates a more developed banking sector, which might correlate with higher SME access to finance. This control is included in order to control for the general financial market development. 3)Internet Penetration (InternetPen) – represents the percentage of the population that uses the internet; this controls for digital infrastructure and technology adoption. Considering peer-to-peer lending activity is mostly done online, a higher internet usage rate could provide a higher peer-to-peer lending volume. 4)Institutional Governance – regulatory quality (RQ) captures the perception of a government's ability to formulate and implement regulations and policies that support the private sector development. It is measured on a scale from -2.5 to +2.5, from very weak to very strong, with higher scores indicating stronger governance and a more effective regulatory environment, which may foster a more stable and transparent

environment for financing. This control variable aligns with institutional theory; a higher level of regulatory quality is expected to enhance lender and investor confidence, thereby improving SME access to external finance (Rau, 2020). 5)Legal Origin (LegalO) – This dummy variable is used to control for legal origin, with values of 1 for countries with English common law and 0 for civil-law. Legal origin is a proxy for fundamental institutional differences; common-law countries often have stronger investor protections historically. 6) Region Dummies (RegDummy) – We include regional dummy variables in order to capture broad geographic/institutional differences not explained by other variables.

3.4 Data Collection

All data collection for this research happened using reliable and trusted secondary data sources, the World Bank Enterprise Survey and the IMF Financial Access survey provided most of the data for traditional financing, along with the Cambridge Center for Alternative Finance, which provides the data for P2P lending volumes.

3.5 Data Preparation

Due to the high variation in years when the World Bank survey was conducted, and the differences in definitions and years across sources, preprocessing was required. All monetary figures were converted to the most recent year of the study, 2018, using IMF exchange rates, missing variables were flagged for future processing in R, country identifiers were adjusted for ISO-3 codes, and classified by regions following the World Bank's classification. As the data was gathered manually, an accuracy check was conducted on 20% of the countries in order to ensure that the data was imported properly and to check for human error. A total of 1 changes were made across the 25 countries that were randomly selected by R, confirming reliability. An R script was run to check the number of missing values for each variable in order to retain sample size and uphold statistical validity. Different practices were used based on the % of missing data.

High-missing variables: P2P_vol (42.6%), SME_LoanAccess (24.2%). These values are absent either because a nation did not report p2p lending volumes in the study years, or because it did not get selected between rounds of WBES. I used multiple imputations by chained equations (MICE) with m=50 imputations, recommended in previous research for missing rates up to 50% (White, Royston, & Wood, 2011; van Buuren, 2011). The imputation model used all variables to better predict outcomes, leveraging the variables' correlation (Horton & Kleinman, 2007).

Low-missing variables: Fin_depth (7.9 %), InternetP (5.4 %), Depth_credit (2.6%), RQ (2.6 %), GDP (1.3 %). For these variables, I performed linear interpolation and last-observation-carried-forward/backward, to maintain each variable's natural year-to-year progression without overfitting the data. (Zuur, Ieno, & Elphick, 2010)

For the regulatory burden index credit, the two components were reverse-coded, so that higher index values denote weaker creditor rights and credit information coverage, in other words, a higher RB_credit indicates a more burdensome or deficient credit institutional environment, furthermore we standardize and sum the components (Djankov, McLiesh, & Shleifer, 2007). A reliability analysis was run, computing Cronbach's α, in order to check if the set of items has enough variance to justify summing or averaging them into a single index. The assumption is made that items in a scale are unidimensional (DeVellis, R. F., 2017). The result of the check are as follows: α=0.29, even if the value is low, with only two items α systematically underestimates reliability (Eisinga et al., 2013), and the inter-item correlation r=0.31 faintly exceeds the common threshold of 0.30 for brief scales (Clark & Watson, 1995) The detailed analysis result can be visualized in Appendix, Figure 2: Cronbach α for Regulatory Burden Credit in the Appendix section.

3.6 Empirical Model Specifications

For this study, I estimate three country-level panel regressions to test my proposed hypothesis and answer the research question. The model analyses one of the imputed datasets, more specifically, .imp=1, which was randomly selected from the m=50 datasets generated with the help of the mice algorithm. Under Rubin's (1987) multiple imputation framework, all imputed datasets are assumed to be drawn from the same distribution and are thus considered interchangeable. The final inference is obtained by pooling the regression estimates from all m=50 datasets using Rubin's rule, which combines within and between imputation variance in order to yield realistic standard errors and confidence intervals (Rubin, 1987; van Buuren, 2018).

Each model adheres to the following general specifications: $Y_i = \alpha + \sum_k \beta_k X_{ki} + \varepsilon_i$, where Y_i denotes the dependent variable for country i, X_{ki} represents the set of explanatory variables, in this case, the regulatory indicators and control variables. The coefficients βk are the primary interest in the study as they quantify the direction and magnitude of the relationship between the exploratory variables and the dependent variables. All models are estimated using fixed-effect panel regression to control for time-invariant country characteristics. The models were also estimated using parallel random effects models to allow the inclusion of the region dummy and capture geographic heterogeneity, enabling a comparative assessment of regulations across global regions. This dual-specification strategy follows best practices in cross-country institutional research (e.g., La Porta et al., 1998; Djankov et al., 2007). In total, three models are presented to test all hypotheses and answer the research questions:

Model 1: $SME\_LoanAccess_i = \alpha + \beta_1 RBI\_credit_i + \beta_2 log(GDP_i) + \beta_3 DtP_i + \beta_4 RQ_i + \varepsilon_i$

This model tests if stronger creditor rights (RB_credit) translate into a larger percentage of SME having a bank loan, once macro scale (log(GDP)), credit depth (DtP), and institutional quality (RQ) are held constant. A positive term on RB_credit will confirm that reducing legal friction and improving access to information directly impact bank financing for SME.

Model 2: $log(P2P\_vol_i) = \alpha + \beta_1 CRIndex_i + \beta_2\ log\ log\ (GDP_i) + \beta_3 InterP_i + \beta_4 FinDepth_i + \beta_5 RQ_i + \beta_6 Region_i + \beta_7 LegalO_i + \varepsilon_i$

This model tests whether the crowdfunding regulatory index impacts platform activity once economic scale, internet reach, banking depth, governance, region, and legal origin are all controlled for. A significant $\beta 1$ would show that clear,

supportive P2P rules increase the volume of peer-to-peer lending activity for a specific country.

Model 3: $FinancialC_i = \alpha + \beta_1 LawDummy_i + \beta_2 RB\_credit_i + \beta_3 log(GPD_i) + \beta_4 FinDepth_i + \beta_5 RQ_i + \beta_6 Internet_{pen_i} + \beta_7 Region_i + \varepsilon_i$

This model tests whether having a dedicated peer-to-peer law reduces the percentage of firms that report finance as a major obstacle, with a negative coefficient meaning that well-crafted fintech regulation can ease credit constraints that standard banking channels have not solved.

We estimate the previously mentioned models using panel regression techniques that fit our data structure, countries observed over several years, with slow-changing variables, employing two estimators for robustness: 1) Pooled OLS with cluster-robust standard errors: We first pool all country-year observations and run OLS, clustering standard errors by country to account for heteroskedasticity and serial correlation (Baltagi, 2005). This gives an overall cross-country effect, treating the data as a panel but without fixed effects. 2) The choice for the second regression was guided by the Hausman specification test (Hausman, 1978), which formally evaluates whether the random-effects estimator is consistent (null hypothesis) or whether one must instead employ fixed effects. Based on the results, the following regressions will be run for each hypothesis: 1)Fixed effects – Hypothesis 1; 2)Random effects – Hypothesis 2 & 3. The results of the test can be seen in Figure 3 in the Appendix: Hausman Test

4. DATA ANALYSIS AND RESULTS

4.1 Descriptive Statistics

P2P volume averages around $1.6 billion US, with a few platforms dominating the market, requiring a logarithmic transformation in the regression. SME loan access shows that 34% of firms have a bank loan. CRIndex is low, at 0.26, confirming that most countries lack dedicated legislation. RBI_credit averages 5.6 out of 12, leaving room for stronger investor protection. GDP is highly skewed because of a few big economies; thus, it will be log-transformed in regression. Internet penetration is at 51%, below the world average of 63%, which happens mainly because the sample includes more low-income economies. 12.2% of firms face financial constraints on average. Crowdfunding-law adoption is low: the variable averages 0.14, so only 14 % of country-years have a dedicated law in place. Regulatory sandboxes are even rarer, with a mean of 0.0,7 fewer than one in ten observations feature a sandbox program. Domestic credit to the private sector stands at 60% of GDP, matching usual middle-income levels. Regulatory quality averages 0.13, indicating slightly positive governance. Legal origin has a value of 1 for 30% of countries, meaning that 30% are common-law countries. The descriptive statistics table can be found in the Appendix : Figure 4 Descriptive 4Statistics

4.2 Correlation Matrix

The correlation matrix is presented in Figure 5 in the Appendix: Correlation Matrix, including all variables used in this study. Three main categories have been identified: 1)low and moderate correlation (0.00-0.59) (Evans 1996), which signals that the variables selected do not duplicate one another (Chan, Jaggia, & Kelly, 2022). GDP and Regulatory Burden for credit index have a correlation of -0.18, which supports the idea that more developed economies tend to ease the entry procedures (Djankov et al., 2002). P2P volume and internet penetration show a correlation of +0.51; the values are lower than expected, considering the strong connection between digital connectivity and P2P platforms. Domestic credit to the privet sector and Regulatory quality correlate +0.56, this is supportive of the idea that stronger institutions support financial development (Beck, Demirgüç-Kunt, & Maksimovic, 2005), although the coefficient falls below the collinearity threshold, indicating that regulatory quality reflects broader aspects of the governance than the credit depth alone. 2)Strong correlations(0.60-0.79) (Evans 1996) are mostly made from overlapping components; wherever an index is composed, the components will naturally correlate >0.60. This claim is visible for the following correlation: The regulatory burden credit index with depth of credit having a correlation of +0.76, as it is composed of this indicator from Doing Business, which is closely related. 3)Very strong correlations (0.80-1.00)(Evans 1996), represent structural collinearity. Crowdfunding regulatory index and regulatory law have a +0.94 correlation, which is explained by the fact that the regulatory index for crowdfunding has it's component regulatory law which represents a scale of 0-2 from the total scale of the index 0-4, for this study it was decided to use only the index without the components to avoid multicollinearity.

4.3 Regression Results

The regression results can be found in the Appendix, Figure 6: Regression Analysis Results. Asterisks denote significance; *** for $p < 0.01$, ** for $p < 0.05$, * for $p < 0.10$—while unstarred coefficients are not significant at the 10 % level.

~~4.4 Discussion on Results~~

Model 1 Regulatory burden for credit is positive and significant in the OLS pooled regression ($\beta = 2.63$, SE = 1.00, $p < 0.01$). Because the index is reverse-scaled, a higher value means stronger legal rights and better credit information. Concluding that better protection is associated with more SME access to bank financing. We observe that in the two-way fixed-effects column, the coefficient on RB_credit turns small and insignificant ($\beta = -0.77$, $p = 0.46$). Cross-sectionally, richer economies and those with higher regulatory quality have greater SME loan penetration, but neither variable matters in the fixed effect regression. Hypothesis 1 receives only partial support; once we control for time-invariant country characteristics, the effect of creditor protection disappears. These findings are similar to La Porta et al. (1997), with the consideration that the relationship may be driven by between-country heterogeneity rather than policy change.

Model 2 – CRIndex is highly significant in both pooled OLS ($\beta = 0.56$, SE = 0.13, $p < 0.001$) and the random-effects model ($\beta = 0.60$, SE = 0.16, $p < 0.001$). A one-point improvement in the index raises log P2P volume by roughly 0.6. The control variables are also significant; log(GDP) is positive and strongly significant, while RQ is positive and significant at the 5% level. At a regional level, CRIndex still remains the dominant driver, with the only mention being North America, which has a very big baseline. This reinforces the idea that specific regulations, and not a country's location, are what foster growth in alternative finance, with the US being the only exception. CRIndex

coefficient provides full support for Hypothesis 2. These findings reinforce prior work (Rau 2020) by demonstrating that dedicated, enabling rules are a primary driver of alternative-finance growth, not just a complementary factor.

Model 3 – Regulatory law is insignificant in both models, RB_credit is positive and significant in pooled OLS ($\beta = 1.67$, SE = 0.64, $p < 0.01$), indicating that weaker creditor rights increase the share of SMEs reporting finance as an obstacle. In RE, the coefficient shrinks towards 0 and becomes insignificant, suggesting the OLS result is driven by static country differences. The region matters a lot, especially in Latin America & the Caribbean (LAC) and Sub-Saharan Africa (SSA), while having a P2P law does not. RB_credit fades once we control for countries, while the regional gaps stay, showing that local issues such as weak courts, bank dominance, and poor information systems, hinder the access of small firms more than crowdfunding laws do. Following our results, there is no evidence that adopting a P2P law lowers SME financing constraints. H3 is therefore not supported; other institutional factors dominate.

5. THEORETICAL IMPLICATIONS

This study's findings provide support within the context of SME finance and carry significant implications for institutional theory, agency theory, and signalling theory. The results support institutional theory's assumptions that robust formal institutions, more precisely credit rights and comprehensive credit information systems, have a positive impact on SME's financial inclusion. Following La Porta et al.'s (1998) and the association between institutional quality and SME loan access, the foundational proposition that the law matters underscores the role that effective regulatory frameworks and transparency of information have a direct effect on SME financing. Following our results, we observe that simply enacting P2P lending laws does not immediately resolve adverse selection or moral hazard in SME finance; investors instead rely on macroeconomic conditions and institutional strength. Furthermore, the impact of regulatory measures emerges once they have matured and market participants have adjusted, suggesting that effective enforcement, enhanced transparency requirements, and complementary safeguards are essential to reduce information asymmetry and build investor confidence.

6. INDUSTRY IMPLICATIONS

This study's findings provide support for policymakers, regulators, and industry stakeholders who are interested in improving SME accessibility to financing. Policymakers should improve creditor rights, expand and provide effective credit information systems, and enact collateral laws. These would further increase lenders' confidence, thereby increasing banks' willingness to lend to SME. More practical solutions include improving bankruptcy procedures and expanding the coverage and effectiveness of credit bureaus. For the regulatory environment that oversees emerging crowdfunding markets, proper regulatory frameworks are crucial. While it has been observed that clear rules and investor protection are beneficial, overly restrictive regulations could limit market development unintended. Policymakers should continuously monitor and refine based on industry feedback. Countries that successfully managed this balance (UK, Singapore) have utilized regulatory sandboxes and continuous adjustments to support innovation while mitigating risks. A final recommendation for policymakers is that they must be cautious about overregulation. Excessive bureaucracy or burdensome compliance requirements negatively affect SME financing opportunities. Findings on H3 suggest that region-specific institutional frictions eclipse narrow P2P laws, reinforcing institutional theory's claim that legal and informational infrastructures, not bespoke fintech rules, shape SME credit outcomes.

7. CONCLUSION

After researching how regulatory frameworks for bank lending and P2P crowdfunding affect SME access to finance, using data from 125 countries (2014–2018), three main findings emerge: 1)robust institutions, more specifically strong creditor rights and comprehensive credit information systems,, are essential for SME access to traditional financing. 2) Supportive peer-to-peer regulations can increase the volume of alternative finance, although their impact is modest compared to macroeconomic conditions. Crowdfunding thrives mainly where economic and institutional foundations are already strong, suggesting it serves as a complement rather than a substitute for traditional finance in the short term. 3)persistent, region-specific friction overrides narrow P2P laws. Even after we allow for creditor rights, data quality, and macro factors, SMEs in Latin America & the Caribbean and Sub-Saharan Africa still face far tougher credit barriers than those in North America or East Asia. The gap is being dominated by weak courts and bank dominance, and not P2P laws.

This study reinforces institutional theory and refines agency and signalling perspectives in SME finance. It provides future recommendations towards policymakers to strengthen core legal infrastructure while carefully expanding the fintech regulations in order to diversify and improve SME access to financing.

8. LIMITATION AND FUTURE RESEARCH

This study currently has several limitations that affected the results of the research. First, all variables are country-level aggregates. Enterprise-Survey loan and constraint rates depend on differing survey waves and SME definitions, and P2P-volume statistics may mix consumer and business lending and are thin for pre-2016 observations. A natural extension is to utilize firm-level micro-data combined with transaction-level FinTech records, which would allow for a multi-level(firm, sector, country-level) modelling. Second, the verification remains uncertain. Fixed-effects reduce unobserved heterogeneity, yet reverse causality is plausible: expanding SME credit markets may precipitate stronger creditor-rights statutes, and fast-growing P2P sectors can prompt governments to legislate. Third, the dual-framework test is only a first step. The interaction term treats the relationship as strictly linear, yet the real effect may kick in only after certain periods or triggers, for example, supportive P2P rules might matter only when traditional banking rules are not too restrictive. Fourth, omitted factors persist. Bank competition, interest-rate spreads, macro-stability, digital infrastructure, and cultural trust all influence SME finance but

were excluded for data-availability reasons. Incorporating these covariates, or employing Bayesian model averaging, would test the robustness of the regulatory coefficients. Finally, the indices we use say only that rules are in place, not how effective those rules are. Crowdfunding laws vary a lot; some impose low fundraising limits or heavy paperwork, while Creditor-rights ratings cannot distinguish between a beneficial collateral registry and a restrictive bank rule. Future work should code the exact features of each statute and pair the numbers with case studies to pinpoint which regulations truly expand SME credit and which ones get in the way.

9. APPENDIX

Figure 1: Variable Table

Variable Type	Variable Name	Short description & scale	Main data source	Cited in (examples)
Dependent	SME_LoanAccess	% of SMEs with a bank loan / line of credit (0-100 %)	World Bank Enterprise Surveys (WBES)	La Porta et al. (1998); Djankov et al. (2007)
Dependent	SME Financial Constraint (FinancialC)	% of firms reporting "access to finance" as a *major* obstacle (0-100 %)	WBES	Beck & Demirgüç-Kunt (2006); Fouejieu et al. (2020)
Dependent	P2P Volume	P2P / crowdfunding volume *per capita* (USD), log-transformed	CCAF Global Alternative-Finance reports	Hornuf & Schwienbacher (2017); Rau (2020)
Independent	Regulatory Burden (credit) (RB_credit)	reversed z-score composite: 1)Strength of legal rights; 2) Depth of credit info (higher = worse)	Doing Business	La Porta et al. (1998); Djankov et al. (2007)
Independent	Crowdfunding Regulation Index (CRIndex)	Sum of 1) law present (0/1) 2)strictness scale (0–2) 3) sandbox dummy (0/1)	CCAF; OECD; EU fintech studies	Hornuf & Schwienbacher (2017); Rau (2020)
Control	log(GDP) per capita	Natural log of GDP per capita (constant USD)	World Bank WDI	La Porta et al. (1998); Djankov et al. (2007)
Control	Domestic Credit / GDP (DtP)	Domestic credit to private sector (% of GDP)	World Bank WDI; IMF	Beck & Demirgüç-Kunt (2006); Djankov et al. (2007)
Control	Internet Penetration (InternetPen)	% of population with internet access	World Bank WDI	Rau (2020); Hornuf & Schwienbacher (2017)
Control	Regulatory Quality (RQ)	WGI: −2.5 (poor) → +2.5 (effective regulation)	World Bank WGI	Rau (2020); Djankov et al. (2007)
Control	Region Dummies	Factor dummies for major World Bank regions (EAP, EAC, LAC, MENA, NA, SA, SSA)	World Bank regional codes	Widely used in cross-country studies
Control	Legal Origin (LegalO)	Dummy: common-law = 1, civil-law = 0	La Porta et al. (1998)	Djankov et al. (2002)
Control	Regulatory Sandbox	Dummy: sandbox program present = 1, else 0	CCAF; national fintech reports	Hornuf & Schwienbacher (2017); CCAF (2019)

Figure 2: Cronbach α for Regulatory Burden Credit

Scale/Item	α (raw)	α (std)	Avg. r	G6 (SMC)
Full Credit-Burden Scale	0.29	0.29	0.17	0.17
If "legal_rights" dropped	0.17	0.17	0.17	0.17
If "depth_credit" dropped	0.16	0.17	0.17	0.17

Figure 3: Hausman Test

Model	χ^2	df	p-value	Decision
H1	11.416	4	0.02227	Reject H_0 → RE inconsistent; use FE
H2	82.583	5	0.1426	Fail to reject H_0 → RE consistent
H3	39.701	6	0.6807	Fail to reject H_0 → RE consistent

Figure 4: Descriptive Statistics

Variable	n	mean	sd	min	max	range	se	skew	kurtosis	median	trimmed	mad
P2P Lending Volume (P2P_Volume)	620	1,61E+09	1,79E+10	500	3,27E+11	3,27E+11	7,19E+08	14,46	225,59	6229582	24822446	8936917
SME Loans (% of total) (SME_LoanAccess	620	34,99	17,16	4,7	79,6	74,9	0,69	0,38	-0,49	33	34,28	17,35
Crowdfunding Reg. Index (CRIndex)	620	0,26	0,8	0	4	4	0,03	3,46	11,42	0	0,04	0
GDP (USD)	620	6,15E+11	2,09E+12	4,21E+08	2,07E+13	2,07E+13	8,41E+10	6,9	53,17	5,6E+10	1,97E+11	7,46E+10
Internet Penetration (InternetPen)	620	0,51	0,29	0,01	0,98	0,97	0,01	-0,09	-1,35	0,54	0,51	0,4
License Constraint (FinancialC)	620	12,18	10,08	0,1	48,9	48,8	0,4	1,41	1,98	9,7	10,74	8,52
Crowdfunding Law Exists	620	0,14	0,47	0	2	2	0,02	3,32	9,69	0	0	0
Regulatory Sandbox	620	0,07	0,25	0	1	1	0,01	3,38	9,45	0	0	0
RB_credit	605	5,63	3	0	12	12	0,12	-0,07	-0,77	6	5,63	2,97
Domestic to Private Credit	610	0,6	0,47	0,02	2,52	2,5	0,02	1,27	1,31	0,47	0,54	0,38
Regulatory Quality	605	0,13	0,96	-2,28	2,22	4,5	0,04	0,26	-0,74	-0,04	0,1	1,05
Legal Origin (Common Law = 1)	620	0,3	0,46	0	1	1	0,02	0,88	-1,23	0	0,25	0

Figure 5:Correlation Matrix

Variables	P2P_Volume	LoanAccess	CRIndex	GDP	Internet Pen	FinancialC	Regulatory_law	RB_credit	LegalO	Depth_credit	FinDepth	RQ
P2P_Volume	1											
LoanAccess	-0,05	1										
CRIndex	0,06	0	1									
GDP	0,51	-0,07	0,08	1								
InternetPen	0,02	0,38	0,32	0,21	1							
FinancialC	-0,08	0,07	-0,11	-0,07	-0,2	1						
Regulatory_law	0,12	-0,01	0,94	0,11	0,29	-0,08	1					
RB_credit	0,01	0,23	0,21	0,18	0,49	-0,05	0,17	1				
LegalO	-0,05	0,13	0,11	0,09	0,18	-0,02	0,08	0,76	1			
Depth_credit	0,07	0,23	0,21	0,18	0,57	-0,06	0,19	0,76	0,17	1		
FinDepth	0,18	0,18	0,25	0,38	0,53	-0,17	0,24	0,25	0,11	0,27	1	
RQ	-0,01	0,31	0,36	0,21	0,83	-0,26	0,34	0,54	0,32	0,51	0,58	1

Figure 6: Regression Results

	Model 1		Model 2		Model 3	
	LoanAceess		P2P_volume		FinancialC	
	Pooled-OLS	Fixed Effects	Pooled-OLS	Random Effects	Pooled-OLS	Random Effects
Intercept	90.38***(8.87)	—	4.62***(1.37)	4.66 (2.98)	4.04 (5.61)	13.80***(2.98)
RB_credit (I)	2.63**(1.00)	−0.77 (1.05)	—	—	1.67**(0.64)	0.005 (0.056)
Regulatory_law (I)	—	—	—	—	−0.00 (0.90)	−0.002 (0.048)
CRIndex (I)	—	—	0.56***(0.13)	0.60***(0.16)	—	—
log(GDP) (C)	−2.32***(0.36)	−1.25 (2.90)	0.46***(0.06)	0.46***(0.12)	0.34 (0.24)	−0.055 (0.119)
FinDepth (C)	3.11 (1.74)	−0.85 (1.00)	0.31 (0.27)	0.14 (0.36)	−0.72 (1.11)	−0.015 (0.056)
InternetPen ©	—	—	−1.29*(0.65)	−1.64 (0.86)·	1.17 (2.58)	−0.084 (0.260)
RQ ©	6.44***(1.00)	1.48 (2.50)	0.50**(0.19)	0.62* (0.31)	−3.97***(0.82)	−0.217 (0.135)
LegalO ©	—	—	−0.06 (0.24)	−0.07 (0.34)	—	—
Europe & Central Asia	—	—	0.10 (0.37)	0.14 (0.46)	4.92***(1.36)	1.64 (1.19)
Latin America & Caribbean	—	—	-0.44 (0.37)	-0.42 (0.47)	10.79***(1.39)	10.62***(1.34)
Middle East & North Africa	—	—	-0.88 (0.50)·	-0.79 (0.64)	1.85 (2.01)	0.68 (1.88)
North America	—	—	5.39***(1.15)	5.48***(1.47)	2.77 (4.48)	1.65 (4.45)
South Asia	—	—	-1.40*(0.56)	-1.43*(0.71)	-4.05 (2.14)·	-1.23 (2.14)
Sub-Saharan Africa	—	—	-0.34 (0.34)	-0.42 (0.43)	3.32*(1.35)	4.96***(1.24)
Country FE	—	✓	—	—	—	—
Year FE	—	✓	—	—	—	—
N (obs)	595	595	600	600	595	595
R-squared	0.167	0.004	0.236	0.153	0.084	0.007
Adj / within R^2	0.162	−0.264	0.228	0.144	0.075	−0.003

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