



Facultad de Ingeniería
Universidad de Concepción

Universidad de Concepción
Facultad de Ingeniería
Departamento de Ingeniería Industrial



Departamento de
Ingeniería Industrial
Universidad de Concepción

Desempeño Empresarial y Acceso al Financiamiento en Empresas Chilenas: Fuentes de financiamiento y estructura de capital

Tesis presentada al Departamento de Ingeniería Industrial
de la Universidad de Concepción para optar al grado de

Doctor en Ingeniería Industrial

Profesor guía

Sebastián Astroza Tagle

Profesora co-guía

Marcela Parada Contzen

Juan Carlos Manríquez Garay

Septiembre 2026

© 2026, Juan Carlos Manríquez Garay

Se autoriza la reproducción total o parcial, con fines académicos, por cualquier medio o procedimiento, incluyendo la cita bibliográfica del documento.

A mis dos amores, Fabiola y Antonia

Resumen

Esta tesis reúne los hallazgos de dos investigaciones que analizan el financiamiento empresarial en Chile utilizando datos de la Encuesta Longitudinal de Empresas (ELE). La primera investigación examina el impacto de distintas fuentes de financiamiento (públicas y privadas) sobre el desempeño en ventas, la productividad laboral y la productividad del capital de empresas chilenas, empleando modelos econométricos de efectos fijos con datos del período 2013-2019. Los resultados muestran que el financiamiento mediante capital y emisión de bonos influye positivamente en las tres medidas de desempeño, mientras que el crédito de proveedores, el financiamiento no bancario y el financiamiento público mejoran las ventas y la productividad laboral, pero no la productividad del capital. La segunda investigación aborda el acceso al financiamiento como factor determinante del crecimiento empresarial, con especial atención en las micro y pequeñas empresas, cuyas características particulares pueden limitar dicho acceso. A partir de una muestra de 28.361 empresas chilenas provenientes de la misma encuesta (2013-2022), se analiza el efecto del tamaño de la empresa, la rentabilidad de los activos, la tangibilidad y otras características organizacionales sobre las decisiones de financiamiento y la estructura de capital, distinguiendo entre financiamiento privado externo, financiamiento público externo y financiamiento interno. Los resultados revelan patrones diferenciados según el tamaño de la empresa: las micro y pequeñas empresas prefieren el financiamiento externo por sobre el interno, mientras que las medianas y grandes empresas muestran la tendencia opuesta. Ambas investigaciones realizan una contribución relevante a la literatura latinoamericana sobre financiamiento empresarial, un área con vacíos importantes en la región. Al desagregar las fuentes de financiamiento en categorías específicas y ampliar el análisis a empresas de distinto tamaño (incluyendo medianas y grandes), este cuerpo de trabajo ofrece una comprensión más completa de la relación entre financiamiento, estructura de capital y desempeño empresarial en economías emergentes.

Agradecimientos

Quiero comenzar agradeciendo a mi esposa Fabiola, cuyo apoyo incondicional estuvo presente desde el primer momento en que postulé a este programa. Su compañía ha sido un pilar fundamental en cada etapa de este camino. Agradezco también el entusiasmo genuino de mi hija Antonia, quien desde que supo quiso ver a su papá convertido en Doctor en Ingeniería Industrial, motivación que en más de una ocasión me dio fuerzas para seguir adelante. A mis hermanas y hermanos, gracias por las muestras de afecto y orgullo que manifestaron a lo largo de este proceso; cada gesto fue muy significativo para mí.

Un hito clave en este recorrido lo representó la Dra. Lorena Pradenas Rojas, quien al momento de consultar por el programa no dudó en depositar su confianza en mí e invitarme a participar. Su gesto marcó el inicio de esta aventura académica y le estoy sinceramente agradecido por ello. En este mismo camino, quiero reconocer y valorar el compromiso de mis profesores guía y co - guía, Sebastián Astroza Tagle y Marcela Parada Contzen, cuya exigencia, dedicación y apoyo constante fueron esenciales para alcanzar esta meta. Sin su esfuerzo y orientación, este logro no habría sido posible.

Quisiera expresar mi profundo agradecimiento al Decano de la Facultad de Ciencias Económicas y Administrativas, Sr. Álvaro Escobar González, y al Director del Departamento de Administración, Sr. Francisco Sepúlveda Laurence, por su invaluable apoyo a lo largo de este proceso académico. Asimismo, hago extensivo mi sincero reconocimiento a la Universidad de Concepción y al Sindicato N°2 de esta casa de estudios, cuyo generoso respaldo hizo posible el financiamiento de mi formación y me brindó la oportunidad de desarrollarme profesionalmente en el más alto nivel académico.

Tabla de contenido	Pág.
1 Introducción	9
1.1 Obetivos generales y específicos	12
1.1.1 Objetivo general	12
1.1.2 Objetivos específicos	12
1.2 Alcances y limitaciones	12
1.3 Organización del documento	13
2 Effect of Different Sources of Funding on Firm Performance: Evidence from Chile	14
2.1 Abstract	14
2.2 Introduction	14
2.3 Literature Review and Theoretical Framework	17
2.3.1 Literature Review	17
2.3.2 Theoretical Framework	22
2.4 Data Source and Descriptive Evidence	26
2.4.1 Funding Variables	28
2.4.2 Control Variables	31
2.5 Empirical Model	33
2.5.1 Growth Model	33
2.5.2 Pooled Linear Regression Model	34
2.5.3 Fixed Effects (FE) Model	35
2.5.4 Random Effects (RD) Model	35
2.6 Empirical Results	36
2.6.1 Effects of Funding on Sales	36
2.6.2 Effects of Funding on Labor Productivity	39
2.6.3 Effects of Funding on Capital Productivity	41
2.6.4 Autocorrelation, Endogeneity and Exogeneity	44
2.7 Conclusion	46
3 Determinants of Funding Access and Capital Structure: Evidence from Chilean Companies	49
3.1 Abstract	49
3.2 Introduction	49
3.3 Methods	52
3.3.1 Theoretical Framework and Literature Review	52
3.3.2 Data Sources and Descriptive Evidence.....	60
3.3.2.1 Funding and Capital Structure Variables	61
3.3.3 Empirical Model	64
3.3.3.1 Probit Regression Model	64
3.3.3.2 Fixed Effects (FE) Regression Model	65

3.4	Results	66
3.4.1	Effects on External Private Financing	66
3.4.2	Effects on Public Funding	67
3.4.3	Effects on Internal Funding	68
3.4.4	Effects on Firm Leverage	70
3.4.5	Effects on Firm Debt Ratio	71
3.5	Discussion	73
4	Conclusión	76
	Referencias	80

Índice de tablas

2.3.1 Summary of business funding and main findings in Latin America and Chile	20
2.3.2 Summary of business funding and main findings in Europe, Asia, Africa, and North America.....	21
2.4.1 Distribution of firm sizes in each round	27
2.4.2 Distribution of firm sizes by industrial sector.....	27
2.4.3 Data panel structure	28
2.4.4 Variable definitions.....	29
2.4.5 Distribution of funding and firm size.....	30
2.4.6 Description of variables and basic statistics	32
2.6.1 Regression models for sales.....	37
2.6.2 Regression models for labor productivity.....	40
2.6.3 Regression models for capital productivity	43
2.6.4 Joint analysis to measure the effect on performance, according to the type of funding.....	44
2.6.5 Autocorrelation, endogeneity, and exogeneity tests for the three performance models.....	45
3.3.1 Summary of Funding Determinants. Key Findings	55
3.3.2 Summary of the Determinants of Leverage and Debt. Key Findings.....	57
3.3.3 Summary of Performance Measures and Capital Structure. Key Findings	58
3.3.4 Distribution of Funding by Firm Size.....	61
3.3.5 Variables definitions	62
3.3.6 Variables description	63
3.3.7 Variables and basic statistics by firm categories	64
3.4.1 Probit Regression to Measure the Effect on Access to External Private Financing (marginal effects)	67
3.4.2 Probit Regression to Measure the Effect on Access to Public Funding (marginal effects).....	68
3.4.3 Probit Regression to Measure the Effect on Access to Internal Financing (marginal effects).....	69
3.4.4 Fixed Effects Regression to Measure the Effect on Firm Leverage (individual fixed effects).....	71
3.4.5 Fixed Effects Regression to Measure the Effect on Firm Debt Ratio (individual fixed effects).....	72

Capítulo 1

1 Introducción

Las decisiones de financiamiento corporativo constituyen uno de los determinantes más relevantes del desempeño empresarial (Kim y Cho, 2020). En este sentido, las empresas recurren habitualmente a fuentes de financiamiento de origen público o privado, las cuales presentan características, condicionantes y efectos diferenciados sobre la actividad productiva. En el caso de Chile, el financiamiento público adopta principalmente la forma de subsidios adjudicados a través de procesos de evaluación competitiva de propuestas presentadas por las firmas (Mardones y Zapata, 2018), mientras que el financiamiento privado abarca un espectro más amplio de fuentes: banca comercial, capital, crédito de proveedores, emisión de bonos, fuentes informales, entre otros. Comprender de qué manera estas distintas fuentes inciden sobre el desempeño y las decisiones financieras de las empresas constituye un problema de investigación de relevancia tanto académica como de política pública.

Las pequeñas y medianas empresas enfrentan restricciones de financiamiento que les dificultan cubrir sus necesidades de inversión exclusivamente con fondos internos (Nguyen, 2020). Esta situación se agudiza durante períodos de incertidumbre económica, como la crisis financiera global de 2007-2008 (Demirgüç-Kunt et al., 2020; D'Amato, 2020) o la crisis generada por la pandemia de COVID-19 en 2020 (Gopalakrishnan et al., 2022; Wellalage et al., 2022). En respuesta a estas restricciones, algunos países han implementado programas de capital de riesgo respaldados por el Estado para atender a empresas de alto potencial que no son adecuadamente servidas por la banca privada (Minola et al., 2017). La literatura reconoce que las restricciones de financiamiento pueden reducir la productividad laboral y limitar la participación de las firmas en la economía, en especial para las micro, pequeñas y medianas empresas (Motta, 2020). En este contexto, las fuentes de financiamiento - tanto internas como externas, formales e informales - desempeñan un papel central en la configuración del

desempeño empresarial (Fiamohe et al., 2024; Bertoni y Colombo, 2023; Pham y Phan, 2020; Mutsonziwa y Fanta, 2021).

Junto con el análisis del desempeño, la literatura ha prestado creciente atención a los factores determinantes del acceso al financiamiento y de la estructura de capital. Entre los factores internos destacan la productividad laboral, el crecimiento de la firma y los componentes inherentes a su estructura de capital y deuda (Jansen et al., 2023). Abdullah y Tursoy (2021) vinculan el desempeño financiero con la estructura de capital, encontrando que ambas variables pueden influirse positivamente entre sí, aunque la estructura de capital puede afectar negativamente el desempeño de mercado. Por su parte, Kieschnick y Moussawi (2018) establecen una asociación entre la edad de la firma, el gobierno corporativo y la estructura de capital, concluyendo que, a mayor poder de los directivos, menor es el endeudamiento de la empresa a medida que esta envejece. En una línea similar, D'Amato (2020) demuestra que las pymes italianas durante la crisis financiera global de 2008-2009 basaron su estructura de capital en deuda de corto plazo, siendo el apalancamiento financiero determinado principalmente por la rentabilidad, la liquidez, la tangibilidad de los activos y el riesgo empresarial.

Las características del gobierno corporativo también ejercen influencia sobre las decisiones de financiamiento. García y Herrero (2021) señalan que la diversidad de género en los directorios de empresas europeas reduce la probabilidad de quiebra, el nivel de apalancamiento, el costo de la deuda y su madurez. Asimismo, Alves et al. (2015) concluyen que las empresas cuyos directorios están integrados por directores independientes tienden a depender en mayor medida de fuentes de financiamiento externas, en comparación con las utilidades retenidas. Estos resultados sugieren que tanto los factores internos como las características de la gobernanza corporativa moldean de manera significativa las decisiones financieras de las firmas, con efectos que varían según el tamaño y la edad de la empresa.

La presente tesis aborda estas brechas mediante dos estudios empíricos complementarios que utilizan datos de la Encuesta Longitudinal de Empresas (ELE) de Chile. El primer capítulo, titulado "Effect of different sources of funding on firm performance: Evidence from Chile", analiza el impacto de distintas fuentes de financiamiento - tanto públicas

como privadas - sobre el desempeño de las empresas chilenas, medido a través de las ventas, la productividad laboral y la productividad del capital. Mediante modelos econométricos de efectos fijos aplicados a datos del período 2013 - 2019, este capítulo desagrega el financiamiento en categorías específicas - emisión de capital, bonos, crédito de proveedores, financiamiento no bancario y financiamiento público - evaluando sus efectos diferenciados sobre cada dimensión del desempeño empresarial.

El segundo capítulo, titulado "Determinants of Funding Access and Capital Structure: Evidence from Chilean Companies", complementa el análisis anterior al examinar los factores que determinan el acceso al financiamiento y la estructura de capital de las empresas chilenas, considerando una amplia muestra de 28.361 firmas del período 2013 - 2022. A diferencia de la mayoría de los estudios precedentes, este capítulo incorpora simultáneamente a microempresas, pequeñas, medianas y grandes empresas, permitiendo identificar patrones diferenciados según el tamaño de la firma. Los resultados revelan que las empresas de menor tamaño exhiben una preferencia por el financiamiento externo por sobre el interno, mientras que las firmas medianas y grandes exhiben la tendencia opuesta, ofreciendo evidencia relevante para el debate sobre la jerarquía financiera en economías emergentes.

Ambos capítulos se articulan de manera coherente en torno a dos preguntas centrales e interdependientes: ¿cómo acceden las empresas chilenas a las distintas fuentes de financiamiento y qué factores determinan su estructura de capital?, y ¿de qué manera estas decisiones de financiamiento inciden sobre su desempeño productivo? Al responder estas preguntas de forma conjunta, la tesis ofrece una comprensión integral del nexo entre financiamiento y desempeño empresarial en Chile, contribuyendo a la literatura existente desde al menos tres dimensiones. En primer lugar, aporta evidencia empírica robusta sobre una economía emergente latinoamericana utilizando datos longitudinales de largo plazo. En segundo lugar, desagrega tanto las fuentes de financiamiento como las categorías de empresas de manera más detallada que los estudios previos. En tercer lugar, examina simultáneamente los determinantes del acceso al financiamiento y sus consecuencias sobre el desempeño, ofreciendo así una visión integrada de la dinámica financiera empresarial.

A continuación, se presentan los objetivos generales y específicos de esta investigación, junto con los alcances y limitaciones.

1 Objetivos generales y específicos

1.1.1 Objetivo general

Analizar el efecto de las distintas fuentes de financiamiento sobre el desempeño empresarial y el acceso al financiamiento en empresas chilenas.

1.1.2. Objetivos específicos

- Seleccionar las fuentes de financiamiento públicas y privadas para medir su efecto sobre el desempeño empresarial.
- Seleccionar variables para medir efecto sobre la estructura de capital y el acceso al financiamiento.
- Seleccionar variables de control adecuadas para medir el efecto sobre el desempeño, la estructura de capital y el acceso al financiamiento.
- Seleccionar y especificar los modelos adecuados para cada caso.
- Mostrar resultados de los efectos de las fuentes de financiamiento sobre el desempeño empresarial y los determinantes de la estructura de capital y el acceso al financiamiento.

1.2 Alcances y limitaciones

Esta investigación utiliza la base de datos de la Encuesta Longitudinal de Empresas (ELE) del Ministerio de Economía, Fomento y Turismo de Chile. Con el fin de emplear variables explicativas que se mantuvieran estables en el tiempo, el Capítulo 2 considera únicamente cuatro rondas de la ELE correspondientes al período 2013-2019. Esta decisión conlleva, a su vez, la utilización de un panel desbalanceado. La combinación de ambas medidas -la selección de rondas y el uso de un panel desbalanceado- permite minimizar la pérdida de información y obtener resultados consistentes. Por su parte, el Capítulo 3 incorpora la ronda de la ELE del año 2022, sumando así una quinta ronda al análisis, lo que otorga mayor robustez

a los resultados. En ambos estudios se excluyeron las empresas que no registraron ingresos por venta.

1.3 Organización del documento

El resto de la tesis se estructura como sigue. El Capítulo 2 corresponde al primer objetivo específico de esta investigación (Manríquez et al., 2026). Este artículo ya se encuentra publicado en una revista WOS (Latin American Economic Review). El Capítulo 3 corresponde al segundo paper (se encuentra en etapa de revisión de pares) y cubre el objetivo específico 2. Finalmente, en el capítulo 4 se dan las conclusiones para los dos artículos.

Capítulo 2

Effect of different sources of funding on firm performance: Evidence from Chile

2.1 Abstract

This study analyses the impact of different funding sources - public and private - on firm's sales performance, labor productivity, and capital productivity of Chilean firms. We use data from the Chilean Longitudinal Survey of Firms (2013 - 2019), fixed-effects econometric models were employed for their robust fit and reliability. The findings show that funding through capital and bond issuance positively influences all three performance measures, while supplier credit, non-bank funding, and public funding enhance sales and labor productivity but not capital productivity. Firm characteristics, including age, industrial sector, group affiliation, and export activity, also significantly affect performance, with export activity negatively impacting capital productivity. This research makes a unique contribution by disaggregating funding into distinct categories and addressing a notable gap in Latin American studies, offering detailed insights into the funding-performance relationship in this regional context.

Keywords: funding, performance, sales, labor productivity, capital productivity.

2.2 Introduction

Corporate funding decisions are critical determinants of business performance (Kim and Cho, 2020). These decisions typically rely on funding from either public or private sources. In Chile, public funding predominantly takes the form of subsidies awarded through competitive evaluations of firm proposals (Mardones and Zapata, 2018). Private funding, in contrast, encompasses a broader range of sources, including commercial banks, internally generated funds, supplier credit lines, and alternative financing mechanisms.

In this paper, public funding is defined as financial resources provided by the State through specific programs. Private funding, in contrast, encompasses funds from banks,

suppliers, firm-owned resources, investors, retail sources, angel investors, bonds, non-banking institutions, and informal channels.

Small businesses, which often face significant funding constraints, struggle to meet their investment needs through internal funds alone (Nguyen, 2020). In response, some countries have introduced government-backed risk capital programs to address this gap. For example, Italy has implemented such programs to support high-potential small firms that are underserved by private banks (Minola et al., 2017).

The persistent challenges in funding and the ongoing interest in understanding its business implications motivate a deeper analysis of how funding sources impact firm performance. This paper addresses a central question: What is the impact of funding sources on the performance of firms in Chile? We assess performance through three indicators: sales, labor productivity, and capital productivity. To answer this question, we propose ten hypotheses, detailed in Section 2.

Although previous research has examined innovation and funding (Busom and Vélez, 2021; Kapidani and Luci, 2019), financial decisions and small business growth (Bui et al., 2021; Zada et al., 2021), and external funding and investment performance (Guo et al., 2022; Nguyen, 2020), few studies have explored how diverse funding sources impact Chilean firms specifically. This research addresses this gap by providing detailed insights into the relationship between public and private funding sources and firm performance.

Empirical evidence highlights the use of linear regression models to evaluate performance in contexts such as participatory loans (Bertoni et al., 2019) and fixed effects models to analyze investment effects (Nguyen, 2020). Some studies compare pooled linear regressions with fixed effects models to evaluate financial restrictions and financial ratios (Lin et al., 2020). Recent contributions show that the traditional empirical approach that focuses on the average firm effect has yielded mostly inconclusive results (Santi and Santoreli, 2017). In order to verify this claim and to examine a longer time span, we contrast the results of growth model with level models already mentioned.

We use data from the Chilean Longitudinal Survey Firms (ELE, for its acronym in Spanish), published by Ministry of Economy, Development, and Tourism. This database spans four waves (2013 – 2019) and provides comprehensive insights into funding sources accessible to Chilean firms.

This study addresses an unexplored area in the literature by simultaneously examining three distinct performance dimensions (sales level, labor productivity, and capital productivity) in relation to a detailed disaggregation of funding sources. Existing research typically aggregates funding into broad categories (internal vs. external, public vs. private, formal vs. informal). We distinguish between banking, non-banking institutions, retail, informal sources, own funding, supplier credit, public subsidies, capital investors, bond issuance, and angel investors. This disaggregation enables us to identify which funding mechanisms drive each performance dimension, moving beyond the classifications that have dominated prior literature and revealing nuanced relationships that remain obscured in aggregated analyses. Additionally, we incorporate five firm characteristics as control variables: age, size, industrial sector, economic group membership, and export activity. These factors allow for a more nuanced contribution to literature.

When comparing our results with previous studies, we observe several parallels (Wu et al., 2022; Wang and Xu, 2022; Kim and Cho, 2017). Specifically, sales revenue and labor productivity are significantly and positively influenced by supplier funding, capital, bond issuance, and non-bank funding. Similarly, capital productivity shows significant positive responses to funding from capital and bond issuance.

The remainder of the article is structured as follows: Section 2 reviews relevant literature, Section 3 describes the data and variables, Section 4 outlines the empirical models and results, Section 5 discusses findings and implications, and Section 6 concludes.

2.3 Literature review and theoretical framework

2.3.1 Literature review

Numerous studies investigate how funding affects business performance (Bertoni et al., 2019; Hottenrott and Richstein, 2019; Howell, 2019; Herianingrum et al., 2019; Nguyen, 2020). Some focus on sales growth as a performance metric (Santi and Santoreli, 2017; Kim and Cho, 2020), while others examine the role of funding in research, development, and innovation (Huergo and Moreno, 2017; Mardones and Zapata, 2018). Bravo et al. (2023) extend this analysis to include labor productivity, emphasizing its connection to managerial and firm characteristics.

Funding sources vary widely. For example, Nguyen (2020) examines the impact of internal, external, formal, and informal funding on Vietnamese small businesses, identifying local institutions and external funding as key determinants of investment. Similarly, Bertoni et al. (2019) find that public funding programs enhance entrepreneurial activities, while Yuan et al. (2021) show that credit card access improves survival probabilities for small Chinese businesses. Angel investors also play a pivotal role in supporting startups, particularly in their early stages (Capizzi et al., 2021; Croce et al., 2018).

The methodologies employed to assess the impact of funding on business outcomes vary in both approach and focus. Jin et al. (2024), using a fixed effects model, it is found that the degree of digital funding of a firm has a positive and significant impact on total factor productivity of Chinese manufacturing companies. Huergo and Moreno (2017) analyzed the likelihood of Spanish firms engaging in research and development activities when supported by low-interest state loans and national or European subsidies. Their findings indicate that European subsidies had a more substantial impact compared to loans and subsidies from the Spanish government. Similarly, Bertoni et al. (2019) applied a growth model and determined that government participatory loans significantly contributed to increases in sales and employment among Spanish entrepreneurs, with the most pronounced effects observed in small, young high-tech firms. Similarly, government subsidies increase R&D activities among Chinese SMEs (Sun et al., 2023).

Previous studies in the field of finance offer valuable insights that inform our research question and the results obtained. For instance, Kim and Cho (2020) utilize a structural equation model to explore the relationship between financial resources and firm performance. Their findings indicate that internal finance and institutional finance positively impact the performance of Korean small and medium-sized enterprises (SMEs), while other forms of capital exhibit a negative effect. Serrasqueiro et al. (2023) demonstrate that in the absence of internal funding, external debt increases the growth of Portuguese SMEs. Similarly, Nguyen (2020) examines the influence of external private funding (both formal and informal) on the performance of small businesses in Vietnam. Using fixed effects modeling, the study reveals a complex interaction between institutional environments and external funding, highlighting that the impact of external funding on business investment can vary significantly across different institutional settings. These findings underscore the interconnected nature of external funding and the broader institutional context.

Recent studies concerning Latin America have shed light on various aspects of funding, particularly focusing on public funding for micro, small, and medium-sized enterprises (Durango et al., 2021). For instance, Fernández (2017) identifies financial constraints, funding sources, and firm characteristics as the key drivers of innovation across Latin American countries. Meanwhile, Durango et al. (2021) analyze factors influencing the likelihood of loan defaults among microenterprises in Bolivia and Colombia. Their findings highlight that variables such as loan amount, frequency of late payments, guarantees provided, and the borrower's gender (male) play significant roles in default probabilities.

In Chile, studies have explored the relationship between public funding and business performance. Research by Martínez et al. (2018) and Navarro (2018) underscores the impact of public funding on various outcomes. Mardones and Zapata (2018) argue for revised and explicit criteria in allocating these funds, emphasizing the need to prioritize small and medium-sized enterprises that face greater financial constraints. Martínez et al. (2018), using data from a public microenterprise program, conclude that public support enhances business practices, employment levels, and labor income. Similarly, Navarro (2018) finds that firms subsidized through Capital Semilla (CORFO) exhibit a higher likelihood of significant sales growth, with a comparable positive impact on business survival rates. Unlike research in developed

countries, there remains a significant gap in studies focused on developing nations. A key limitation is the scarcity of data and the relatively early stage of public R&D, innovation, and entrepreneurship programs, which restrict the development of a more robust empirical foundation (Parada, 2020). Moreover, a large part of the studies focus on public support programs (Akcigit et al., 2024) and their relationship with business activity (for example, innovation and business performance and productivity), leaving aside private funding.

Previous studies (Kim and Cho, 2020) have identified a positive relationship between equity funding and bank funding on firm performance. Moreover, Nguyen (2020) research reports that informal funding has a positive and significant impact on increasing investments in firms. Complementary to the above, the availability of informal financial markets helps reduce the impact of legal barriers on firm growth (Bui et al., 2021).

Given that bank debt is the main source of funding for small and medium-sized enterprises, public policies seek to improve access to credit by focusing on bank loans (Akcigit et al., 2024). Oh and Hwang (2024), using weighting methods to eliminate selection bias, show that public support for R&D in Korean manufacturing firms significantly improves sales and employment.

The literature on business funding and its impact on firm performance provides diverse methodologies and findings across different contexts. Table 2.3.1 highlights key studies conducted in Latin America, including Chile, which predominantly focus on public funding and its implications for innovation, business growth, and performance.

Expanding the scope, Table 2.3.2 presents similar research conducted in Europe, Asia, Africa, and North America. These studies shed light on various funding mechanisms and their outcomes. For instance, Huergo and Moreno (2017) and Bertoni et al. (2019) reveal the significant role of European subsidies and participatory loans in fostering R&D and business growth in Spain. Similarly, Croce et al. (2018) and Hottenrott and Richstein (2019) focus on the effectiveness of angel investors and grants in early-stage investments and R&D funding, respectively. In developing regions, studies like Mawejje and Sebudde (2019) and Nguyen (2020) emphasize the influence of macroeconomic environments and social networks on firm performance.

These tables collectively illustrate the diversity in funding sources, methods, and outcomes across regions, with Latin American research often emphasizing public funding, while studies from other regions explore broader mechanisms such as angel investments, social capital, and targeted monetary policies. This contextual diversity underpins the need for further research into how specific funding sources impact firm performance, particularly in underexplored contexts such as Chile.

Table 2.3.1: Summary of business funding and main findings in Latin America and Chile

Authors (year)	Méthod	Explained variable	Explanatory variables	Country	Main findings
Santi and Santoreli (2017)	Quantile regression	Sales growth.	Innovation in product and process.	Chile	A positive relationship between process innovation and firm growth.
Fernández (2017)	Logistic regression	Innovation rate.	Funding.	Latin America	Financial limitations, funding sources, and firm characteristics are the main drivers of innovation.
Martínez et al. (2018)	Experimental design	Employment rate.	Public support and public funding.	Chile	Chile Public support improves business practices and employment, among others.
Navarro et al. (2018)	Probabilistic model	Probability of starting, growing, and surviving.	Age of the firm and industrial sector.	Chile	A positive association between projects that received subsidies and starting to sell.
Mardones and Zapata (2018)	Binary choice model	Probability of obtaining funding for innovation activities.	Public funding, expenses, number of workers, industrial sector and others.	Chile	Firms that invest in training their workers in R&D activities are less likely to obtain public funding.
Parada (2020)	Fixed effects model and regression equations	Performance (sales, employment, productivity, and Capital).	Public funding, region, industrial sector and others.	Chile	Firms that receive public funding (CORFO) reveal an effect based on experience.
Durango et al. (2021)	Logistic regression	Probability of default.	Loan amount, sex, analyst assessment and others.	Bolivia and Colombia	The risk of non-payment for microcredits is greater when the amount lent is greater.

Source: Own elaboration based on references therein.

Table 2.3.2: Summary of business funding and main findings in Europe, Asia, Africa, and North America

Authors (year)	Method	Explained variable	Explanatory variables	Country	Main findings
Huergo and Moreno (2017)	Treatment effect model.	Probability of developing R&D.	Support programs and European subsidies.	Spain	State loans and European subsidies positively affect R&D development.
Croce et al. (2018)	Linear regression model.	Investment amount.	Number of investors and stage of the firm.	USA	The experience of angel investors is positively associated with investments in the early stages of the business.
Bertoni (2019)	Linear regression model.	Growth in employment and sales.	Investment amount, age of the firm and industrial sector.	Spain	Public funding positively affects business growth for business development.
Hottenrott and Richstein (2019)	Experimental design.	Investment in R&D and employment.	Grants and loans.	Germany	Grants are more suitable than loans for increasing R&D investments.
Howell (2019)	Probit model.	Probability of creating a business	Funding sources and characteristics of the head of household.	China	Han households tend to rely more on formal initial funding.
Herianingrum et al. (2019)	Vector automatic regression (VAR) model.	Long-term business trend.	Funding of the Islamic Bank.	Indonesia	Existence of a long-term relationship between bank funding and business trends.
Kim and Cho (2020)	Structural equation model.	Performance, efficiency, growth.	Financiamiento interno, externo e institucional.	Corea	The positive relationship between capital funding and firm performance.
Nguyen (2020)	Fixed effects model.	Investment.	Funding and firm characteristics.		Social networks improve the relationship between informal finance and firm investments.
Lin et al. (2020)	Fixed effects model.	Cash flow sensitivity.	Monetary policy and firm characteristics.	China	A flexible and targeted monetary policy significantly reduces the financial constraints of small businesses.

(Continued)

Table 2.3.2: Summary of business funding and main findings in Europe, Asia, Africa, and North America (Continued)

Authors (year)	Method	Explained variable	Explanatory variables	Country	Main findings
Yuan et al. (2021)	Probit model.	Survival probability.	Characteristics of the respondent (age, education, among others).	China	Access and use of credit cards improve the probability of survival.
Jin et al. (2024)	Fixed effects model.	Total factor productivity.	Financial ratios and firm characteristics.	China	Digital funding increases total factor productivity.

Source: Own elaboration based on references therein.

Building on the insights from the literature review, this study has established three primary categories to structure and analyze the sources of funding and their impacts on business performance. The first category, funding with own resources, includes firm's assets and additional capital contributions from investors. The second category, Credit Funding, encompasses both formal and informal credit providers, including banks, retail entities, suppliers, non-bank institutions, bond issuances, and informal funding. Lastly, Donation-Based Funding comprises state funding and contributions from angel investors. This categorization provides a clear framework for analyzing the diverse effects of these funding sources on business outcomes.

2.3.2 Theoretical framework

The evolution of corporate capital structure is characterized by two fundamental and significant approaches. First, the Pecking Order Theory (POT), whereby firms follow a specific preference order when funding their operations or undertaking new investments (Myers and Majluf, 1984). Preferably, they initiate investments with internal funds. When internal resources are insufficient, firms resort to debt as their second option, with equity issuance being the least preferred alternative. Second, the Trade-Off Theory (TOT) posits that there exists an optimal debt level that maximizes firm value (Kraus and Litzenberger, 1973). However, economic conditions affect both models. Thus, Souza (2024) study demonstrates that POT is more prevalent than TOT among Brazilian publicly-traded firms during the COVID-19 pandemic period. Beyond the economic context, a firm's leverage level also affects these

theories. Accordingly, TOT performs better for firms with low leverage levels, whereas POT performs better for private firms with high leverage levels (Voutsinas and Werner, 2025).

On the credit supply side, the convergence of Financial Development and Economic Growth Theory (King and Levine, 1993) with Financial Constraints Theory (FCT) (Fazzari et al., 1988) suggests that financial development not only stimulates economic growth but also mitigates the financial constraints firms face. Empirical results show that local financial development and the business environment interact positively in their effects on firm growth (Haschka et al., 2022). However, short- and long-term credit constraints reduce the likelihood of high-growth firms emerging (Nlemvo and Bouslama, 2025). Meanwhile, Ngo and Nguyen (2022) argue that a well-developed financial system alleviates credit constraints for firms.

The rationale for state intervention to stabilize financial markets and promote business performance is grounded in the Theory of Market Failures and Government Intervention (Stiglitz and Weiss, 1981), which argues that financial markets are imperfect due to information asymmetries between lenders and borrowers. In this context, the European Union has increasingly employed market-based approaches and policy outsourcing to the private sector to achieve its objectives of integration, financial stability, and business growth (Mortágua and Solipa, 2022). For instance, Schmidt (2023) demonstrates how public support instruments, through blended finance mechanisms, can enhance the effectiveness of investment social impact.

Agency conflicts grounded in Jensen and Meckling's (1976) Agency Theory, along with information asymmetry challenges posed by Signaling Theory (Ross, 1977), are considered in corporate funding decisions and to some extent impact firm performance. Effects on performance measures vary depending on the funding source and firm characteristics (Bravo et al., 2023; Yuan et al., 2021; Fan et al., 2023; Álvarez et al., 2023). Thus, Khémeri and Noubbigh (2020) findings reveal that small firms are more vulnerable to financial risk. Consequently, they must rely on internal funds to maximize their performance.

Consistent with the literature review and theoretical framework, there are arguments supporting why access to financial resources should flow internally or externally, depending on factors and characteristics inherent to the firm and financial markets. Most reviewed studies

show a positive relationship between a given funding source and firm performance (e.g., Nguyen, 2020; Kim and Cho, 2020; Oh and Hwang, 2024). For instance, store credit cards, funding from non-bank institutions, internal firm funds, and formal and informal funding have positive and significant effects on sales and total factor productivity (Nguyen, 2020; Yuan et al., 2021). Similarly, Kim and Cho (2020) find that non-bank funding negatively impacts firm performance.

Given the above, the following hypotheses relating funding sources and firm performance are established; understanding firm performance as sales revenue, labor productivity, and capital productivity. Below, we develop our hypotheses through a review of the relevant literature.

Building on findings from Nguyen (2020), Kim and Cho (2020), Serrasqueiro et al. (2023) and Jin et al. (2024), we propose hypotheses H1 and H2.

H1: The funding given by retail positively impacts the performance of the firm.

H2: Supplier funding positively affects firm performance.

Kim and Cho (2020) find that while some funding sources positively affect performance, others have detrimental effects. Accordingly, we define hypothesis H3 as follows."

H3: Non-bank funding positively affects firm performance.

Hypotheses H4 and H5 address internal funding sources. Consistent with this focus, Fernandez (2017) finds that internal funding has a positive effect on firm performance.

H4: Capital funding positively impacts firm performance.

H5: Investor funding positively impacts firm performance.

Authors such as Croce et al. (2018) and Hottenrott and Richstein (2019) document the positive effects of angel investor funding on firm performance. Drawing on their findings, we define hypothesis H6 as follows.

H6: Funding from angel investors positively impacts firm performance.

Public funding sources have been examined by several researchers (Martínez et al., 2018; Bertoni et al., 2019; Alvarez et al., 2023, Sun et al., 2023), all of whom document positive effects on firm performance. This evidence supports our formulation of hypothesis H7.

H7: State funding positively impacts firm performance.

Bond funding has received limited attention in the literature. Nevertheless, existing studies demonstrate positive effects on firm performance (Busom et al., 2017; Guergo and Moreno, 2017). This evidence supports the formulation of hypothesis H8.

H8: Funding that comes from bonds positively impacts the performance of the firm.

According to the Pecking Order Theory (Myers and Majluf, 1984), informal funding represents one of the last resort options for firms for small businesses. Nevertheless, these sources positively impact firm performance (Nguyen, 2020). Based on this evidence, we define hypothesis H9 as follows.

H9: Informal funding positively impacts firm performance.

A substantial body of literature demonstrates the impact of firm characteristics on performance (Navarro et al., 2018; Bertoni, 2019; Lin et al., 2020; Jin et al., 2024). Based on this evidence, we define hypothesis H10 as follows.

H10: Firm characteristics do have a significant effect on business performance.

In summary, this paper makes two significant contributions to the literature by addressing gaps that remain underexplored. First, it integrates the analysis of both private and public funding, examining their respective impacts on business performance. This approach acknowledges the diversity of funding sources available to firms, which vary significantly due to differences in corporate structures, sizes, liquidity levels, and management practices, among other factors. Second, it situates the research in a Latin American context, an area with limited studies on this topic, providing valuable geographical insight and addressing unique regional

dynamics that differ from those explored in the existing literature. The findings of this study hold practical relevance, serving as a reference for shaping public policies and guiding decision-making in the private sector, particularly within the financial industry.

2.4 Data source and descriptive evidence

This study uses data from four waves of the Longitudinal Business Survey (ELE) conducted by Chile's Ministry of Economy in 2013, 2015, 2017, and 2019. The ELE survey includes formal businesses ranging from micro to large enterprises across various industrial sectors. By combining fixed and refreshed samples, it provides an unbalanced panel of 51,061 unique observation units over the four rounds. Specifically, the number of firms surveyed in 2013, 2015, 2017, and 2019 was 18,280, 21,823, 6,480, and 4,478, respectively. To assess the representativeness of firms comprising each panel round, an attrition analysis was conducted, revealing substantial and non-random attrition in the panel. Of the firms in Round 1 (2015), only 56.59% remained in Round 2 (2017, attrition rate: 43.41%), 26.52% of firms from Round 2 (2017) remained in Round 3 (2019; attrition: 73.48%), and 68.96% of firms from Round 3 (2019) remained in Round 4 (2022; attrition: 31.04%). The panel is unbalanced, as not all firms are observed in every period; to mitigate attrition bias, additional firms are incorporated in subsequent periods rather than restricting the sample to firms present across all four periods. This explains the difference in sample size between the growth model (Table 2.6.1, Model 1), based on a single observation per firm, and the remaining models, which use all available firm-year observations. This selection excludes firms that do not report sales revenue.

The survey's two key strengths lie in its comprehensive coverage of businesses of different sizes (Table 2.4.1) and its inclusion of all major industrial sectors (Ministry of Economy, Development and Tourism of Chile, 2017): primary, industry, and tertiary (Table 2.4.2). We define the primary sector as that which includes agricultural activities, livestock farming, hunting, forestry, fishing, and mining. The industry sector includes metallic and non-metallic manufacturing industries, electricity, gas and water supply and construction. The tertiary sector includes wholesale and retail trade, hotels and restaurants, transportation, storage and communications, financial intermediation, real estate, business and rental activities, Public Administration and Defense, teaching, social and health services, other

service activities, advice administration of buildings and condominiums, organizations and extraterritorial bodies.

Table 2.4.1: Distribution of firm sizes in each round (%)

Size of the firm	ELE 3 (2013)	ELE 4 (2015)	ELE 5 (2017)	ELE 6 (2019)
Micro	5.44	5.60	20.31	15.60
Small	18.20	30.05	26.72	25.83
Medium	14.94	14.41	14.11	15.61
Large	61.54	50.04	38.94	40.32
Sample size	35.80	42.74	12.69	8.77

Note: (a) One classification for firm sizes is by annual sales (in UF). Thus, Micro = Micro-enterprise (0 - 2,400 UF), Small = Small firm (2,400.01 - 25,000 UF), Medium = Medium-sized firm (25,000.01 - 100,000 UF), Large = Large firm (100,000 UF and more); (b) ELE 3 = Longitudinal Survey of Firms for period 1 (2013), For the rest of the ELE it is the same, referring to each period; (c) One development unit (UF), corresponds to 20,429.09 Chilean pesos for the base year 2008 (Source: Central Bank of Chile).

These features allow for a detailed exploration of the relationship between funding sources and firm performance, accounting for diverse firm characteristics.

Table 2.4.2: Distribution of firm sizes by industrial sector (%)

Size of the firm	Primary Sector	Industry Sector	Tertiary Sector	Sample size
Micro	4.05	0.79	7.26	12.10 (6,178)
Small	6.60	1.99	11.84	20.43 (10,432)
Medium	4.63	2.37	9.26	16.26 (8,303)
Large	19.65	5.35	26.21	51.21 (26,148)
Sample size	34.93	10.51	54.56	100.00 (51,061)

Note: (a) Numbers in parentheses are numbers of firms; (b) Primary sector = Agriculture, livestock, hunting, forestry, fishing and mining and quarrying; Industry Sector = Metallic and non-metallic manufacturing industries, electricity, gas and water supply, construction; Tertiary Sector = Wholesale and retail trade, hotels and restaurants, transportation, storage and communications, financial intermediation, real estate, business and rental activities, Public Administration and Defense, teaching, social and health services, other service activities, advice administration of buildings and condominiums, organizations and extraterritorial bodies.

Following Santi and Santoreli (2017), we measured the effect on the growth of Chilean firms using the difference between the logarithms of sales revenue between the last and first periods; thus, a single growth rate is obtained that covers all four periods (Table 2.4.3). Therefore, the growth rate is expressed as:

$$\Delta Sales_{i,t} = \frac{\ln(Sales_{i,t}) - \ln(Sales_{i,t-d})}{d} \quad (2.3.1)$$

where, $\Delta Sales_{i,t}$ is the growth rate of firm i at time t , $Sales_{i,t}$ is the sales revenue of firm i at time t y $Sales_{i,t-d}$ are the sales revenue of the firm i , d previous years. Sales growth rates are used because of growth in the following period.

Table 2.4.3: Data panel structure

Year	Time	Growth t	Funding $t-1$
2013	$t = 1$	—	Fund $_1$
2015	$t = 2$	$\Delta Sales_{i,2}$	Fund $_2$
2017	$t = 3$	$\Delta Sales_{i,3}$	Fund $_3$
2019	$t = 4$	$\Delta Sales_{i,4}$	—

Note: t_1 = Period 1, which corresponds to the year 2013, Growth $_1$ = Sales growth between 2013 and 2009, Fund 1 = Funding in period 1, which corresponds to the year 2013.

2.4.1 Funding variables

Firms can access various sources of funding, as identified in the ELE 2013, which originally included 12 categories. However, this study narrows the scope to ten funding sources due to changes in subsequent rounds of the survey. Specifically, we include bank funding, non-bank funding, equity, informal sources, public funding and retail funding, supplier credit, venture capital, angel investments, and bonds. Sources such as, funding from stockbrokers is omitted after 2013, while capital raising and capital funding are combined into a single category in later rounds. Additionally, funding from microfinance institutions appears only in the 2015, 2017, and 2019 rounds. Each funding type, such as lines of credit, consumer credit, leasing, and factoring, is detailed within the survey forms.

Table 2.4.4: Variable definitions

Variable	Definition
Dependent variables	Firm performance
Sales	Sales income of the firm, with base year 2013 (in logs)
Labor	Sales/workers = productivity of sales by workers.
Productivity	
Capital	Sales/capital stock = Productivity of sales by capital stock.
Productivity	
i) Explanatory variables	
Bank	Funding from bank loans (line of credit, consumer loans, leasing, factoring, among other things)
Retail	Funding from retail (advance in installments)
Supplier	The funding consists of a line of credit granted by suppliers for the early delivery of their merchandise or supplies.
No Bank	Funding comes from financial institutions other than banks, such as finance firms (factoring, credit, leasing, among others)
Capital	The source of funding is with resources that the owners of the firm have. For example, capital increase.
Investors	The source of funding is the capital contribution of investors.
Angel	The source of funding comes from people or entities that have an interest in promoting business initiatives.
State	Funding is with contributions from the State, through different instruments.
Bond	The firm finances its activities with debt issuance.
Informal	The firm finances its activities with the capital contribution made by its friends, and relatives, among others.
ii) Control variables	
Age	Age of the Firm (log)
Micro	The size of the firm corresponds to a micro business.
Small	The size of the firm corresponds to a small business.
Medium	The size of the firm corresponds to a medium-sized firm.
Large	The size of the firm corresponds to a large firm.
Primary	The firm is inserted in the primary sector (Agriculture, livestock, hunting, forestry, fishing and mining and quarrying)
Industry	The firm is inserted in the industrial sector (metallic and non-metallic manufacturing industries, electricity, gas and water supply, and construction)
Tertiary	The firm is inserted in the tertiary sector (wholesale and retail trade, hotels and restaurants, transportation, storage and communications, financial intermediation, real estate, business and rental activities, Public Administration and Defense, teaching, social and health services, other service activities, board of directors of buildings and condominiums, extraterritorial organizations and bodies)
Group	The firm is part of an economic group.
Exportation	The firm develops export activities.
D (2013)	Period 1 corresponding to the year 2013
D (2015)	Period 2 corresponding to the year 2015
D (2017)	Period 3 corresponding to the year 2017
D (2019)	Period 4 corresponding to the year 2019

Note: The definitions of variables are from the Longitudinal Survey of Chilean Firms (INE).

The selection of financial variables aligns with previous research. For instance, Martínez et al. (2018) demonstrate that public funding significantly boosts employment and

income in the short and medium term. Similarly, Navarro et al. (2018) highlight that state subsidies for participatory projects significantly increase the likelihood of small businesses initiating sales. Other studies emphasize the impact of funding on specific business activities: Fernández (2017) identifies its role in fostering innovation, while Nguyen (2020) links it to increased investments.

Formal and informal funding sources also play a vital role. Yuan et al. (2021) report that both forms significantly contribute to the growth and survival of small businesses in China. Kim and Cho (2020) expand this by exploring internal, institutional, and non-institutional funding, as well as retail funding, finding significant effects on firm performance. In less conventional domains, Croce et al. (2018) show that angel investors provide critical early-stage funding for North American startups.

Table 2.4.4 outlines the explanatory variables for funding as specified in the structure of the Longitudinal Business Survey databases.

Table 2.4.5: Distribution of funding and firm size (%)

Type of Funding	Micro	Small	Medium	Large	Total
Banking	5.2	10.1	6.3	16.9	38.5
Retail	0.3	0.2	0.1	0.2	0.8
Suppliers	3.0	5.9	3.9	10.9	23.7
Non-banking	0.8	1.5	1.0	2.9	6.2
Capital	4.6	7.5	3.9	12.5	28.5
Investors	0.0	0.0	0.0	0.1	0.1
Angel investors	0.0	0.0	0.0	0.0	0.0
State	0.1	0.3	0.1	0.3	0.8
Bond	0.0	0.1	0.1	0.3	0.5
Informal	0.2	0.4	0.1	0.2	0.9
Total	14.2	26.0	15.5	44.3	100.0

Note: (a) One classification for firm sizes is by annual sales (in UF). Thus, Micro = Micro-enterprise (0 - 2,400 UF), Small = Small firm (2,400.01 - 25,000 UF), Medium = Medium-sized firm (25,000.01 - 100,000 UF), Large = Large firm (100,000 UF and more); (b) ELE 3 = Longitudinal Survey of Firms for period 1 (2013), For the rest of the ELE it is the same, referring to each period; (c) One development unit (UF), corresponds to 20,429.09 Chilean pesos for the base year 2008 (Source: Central Bank of Chile). Firms from period 1 (2013), For the rest of the ELE it is the same, referring to each period; (c) One development unit (UF), corresponds to 20,429.09 Chilean pesos for the base year 2008 (Source: Central Bank of Chile).

Large firms absorb the largest share of funding, accounting for 44.3% of total funding across the four size categories (Table 2.4.5). Banks (16.9%), own resources (12.5%), and suppliers (10.9%) are the primary sources for large firms. In contrast, microenterprises receive the smallest proportions: 5.2% from banks, 4.6% from their own resources, and 3.0% from suppliers. Overall, the most significant sources of funding are bank loans (38.5%), own resources (28.5%), and supplier credit (23.7%).

2.4.2 Control variables

We assume that the type of funding alone does not directly influence a firm's growth. To effectively analyze the impact of funding on growth, it is essential to include control variables that may significantly affect this relationship.

One key control variable is the logarithm of the firm's age, which has been shown in previous studies to significantly explain investment patterns in small businesses (Nguyen, 2020; Bertoni et al., 2019; Sauer and Wiesemeyer, 2018; Yuan et al., 2021). Additionally, firm size is an important factor. It is categorized into micro, small, medium, and large enterprises, as this classification has demonstrated a notable effect on firm performance (Mawejje and Sebudde, 2019).

Another critical factor is the industrial sector. Specifically, the tertiary sector, which includes technology, communications, and services, has been highlighted in prior research (Bertoni et al., 2019). In this study, the original 18 industrial sectors are grouped into three categories: primary, industrial, and tertiary (Ministry of Economy, Development and Tourism of Chile, 2014). Membership in a business group (Group) is also considered, as it can enhance strategic decision-making and drive significant sales growth. Similarly, the export variable reflects firms engaged in international markets, where higher sales volumes typically lead to improved performance. Table 2.4.6 shows the summary statistics for each variable.

Table 2.4.6: Description of variables and basic statistics

Variable	Description	Mean	SD	Min.	Max.
Dependent variables					
Sales	= Sales income of the firm, in pesos of 2013 (in logs).	7.33	7.35	3.3	26.87
Labor	= Sales/workers = productivity of sales by workers.	69,456	3,578	0	705,864
Productivity	= Sales/capital stock = Productivity of sales by capital stock.	351,708	79,342	0	1,793,000
i) Explanatory variables					
Bank (baseline)	= 1 if the firm had bank funding (0/1)	0.28	0.45	0	1
Retail	= 1 if the firm was financed with retail (0/1)	0.00	0.08	0	1
Supplier	= 1 if the firm was financed with suppliers (0/1)	0.19	0.39	0	1
No Bank	= 1 if the firm was financed by non-banking institutions (0/1)	0.05	0.22	0	1
Capital	= 1 if the firm was financed with its resources (0/1)	0.25	0.44	0	1
Investors	= 1 if the firm was financed with venture capital (0/1)	0.00	0.03	0	1
Angel	= 1 if the firm was financed with angel investors (0/1)	0.00	0.02	0	1
State	= 1 if the firm obtained funding from the State (0/1)	0.01	0.07	0	1
Bond	= 1 if the firm issued bonds to finance itself (0/1)	0.00	0.05	0	1
Informal	= 1 if the firms accessed non-formal funding (0/1)	0.01	0.09	0	1
ii) Control variables					
Age	= Age of the firm (log)	1.75	1.42	0	5.26
Micro	= 1 if it is a microenterprise (0/1)	0.11	0.32	0	1
Small	= 1 if it is a small business (0/1)	0.26	0.44	0	1
Medium	= 1 if it is a medium-sized firm (0/1)	0.15	0.35	0	1
Large (baseline)	= 1 if it is a large firm (0/1)	0.48	0.50	0	1
Primary	= 1 if the firm belongs to the primary sector (0/1)	0.12	0.32	0	1
Industry	= 1 if the firm belongs to the industry sector (0/1)	0.05	0.21	0	1
Tertiary (baseline)	= 1 if the firm belongs to the tertiary sector (0/1)	0.29	0.45	0	1
Group	= 1 if the firm is part of an economic group (0/1)	0.15	0.36	0	1
Exportation	= 1 if the firm develops export activities (0/1)	0.06	0.24	0	1
D (2013) (baseline)	= 1 if the observation corresponds to period 1 (0/1)	0.40	0.49	0	1
D (2015)	= 1 if the observation corresponds to period 2 (0/1)	0.25	0.43	0	1
D (2017)	= 1 if the observation corresponds to period 3 (0/1)	0.25	0.40	0	1
D (2019)	= 1 if the observation corresponds to period 4 (0/1)	0.27	0.43	0	1
Sample size	= 51,061				

Note: Primary sector = Agriculture, livestock, hunting, forestry, fishing and mining and quarrying; Industry Sector = Metallic and non-metallic manufacturing industries, electricity, gas and water supply, construction; Tertiary Sector = Wholesale and retail trade, hotels and restaurants, transportation, storage and communications, financial intermediation, real estate, business and rental activities, Public Administration and Defense, teaching, social and health services, other service activities, advice administration of buildings and condominiums, organizations and extraterritorial bodies.

Another critical factor is the industrial sector. Specifically, the tertiary sector, which includes technology, communications, and services, has been highlighted in prior research (Bertoni et al., 2019). In this study, the original 18 industrial sectors are grouped into three categories: primary, industrial, and tertiary (Ministry of Economy, Development and Tourism of Chile, 2014). Membership in a business group (Group) is also considered, as it can enhance strategic decision-making and drive significant sales growth. Similarly, the export variable reflects firms engaged in international markets, where higher sales volumes typically lead to improved performance. Table 2.4.6 shows the summary statistics for each variable.

2.5 Empirical model

To analyze the data, this study employs a growth model and three additional regression models, described in subsequent sections. To address potential endogeneity and ensure robustness, we use the Generalized Method of Moments (GMM).

2.5.1 Growth model

The growth model assesses the effect of funding on each dependent variable: sales, labor productivity, and capital productivity. Growth rates for sales revenue are calculated using equation (2.3.1), while equations (2.5.1) and (2.5.2) are used to estimate growth rates for labor and capital productivity, respectively:

$$\Delta LP_{i,t} = \frac{\ln(LP_{i,t}) - \ln(LP_{i,t-d})}{d} \quad (2.5.1)$$

$$\Delta KP_{i,t} = \frac{\ln(KP_{i,t}) - \ln(KP_{i,t-d})}{d} \quad (2.5.2)$$

where, $\Delta LP_{i,t}$ is the growth rate of labor productivity of firm i in time t , $LP_{i,t}$ is the labor productivity of firm i in time t and $LP_{i,t-d}$ is the labor productivity of the firm i , d previous years. Similarly, $\Delta KP_{i,t}$ is the growth rate of capital productivity of firm i at time t , $KP_{i,t}$ is the capital productivity of firm i at time t and $KP_{i,t-d}$ is the capital productivity of the firm i , d

previous years. As each firm contributes a single growth rate covering the four periods, equations (2.5.3), (2.5.4) and (2.5.5) constitute a cross-sectional model, estimated by OLS rather than panel-data methods.

Each growth rate serves as a dependent variable in the following linear regression models:

$$\Delta Sales_{i,t} = \alpha_1 + \beta_1 Sales_{i,t-1} + \gamma_1 \mathbf{Fund}_{i,t-1} + \delta_1 \mathbf{X}_{i,t-1} + u_{i,t} \quad (2.5.3)$$

$$\Delta LP_{i,t} = \alpha_2 + \beta_2 LP_{i,t-1} + \gamma_2 \mathbf{Fund}_{i,t-1} + \delta_2 \mathbf{X}_{i,t-1} + v_{i,t} \quad (2.5.4)$$

$$\Delta KP_{i,t} = \alpha_3 + \beta_3 KP_{i,t-1} + \gamma_3 \mathbf{Fund}_{i,t-1} + \delta_3 \mathbf{X}_{i,t-1} + w_{i,t} \quad (2.5.5)$$

Consistent with Santi and Santoreli (2017), we assume that there is a lag in the growth response due to the introduction of innovations, we consider that, in our research, the same occurs with funding and the rest of the explanatory variables. Therefore, funding and other variables are in terms of the previous period $t-1$. Thus, $\mathbf{Fund}_{i,t-1}$ is a vector of binary variables that indicates whether firm i in period $t-1$ received (1) or not (0) a type of funding, within which the ten funding categories already explained in Table 2.4.4 are included. For its part, $\mathbf{X}_{i,t-1}$ represents the vector of control variables of the firm i during period $t-1$, which includes: the level of employment of the firm, the age of the firm, the size of firms determined according to the level of sales (micro, small, medium, and large), denoted respectively by Micro_{t-1} , Small_{t-1} , Medium_{t-1} y Large_{t-1} . In addition, the vector $\mathbf{X}_{i,t-1}$ contains the variables corresponding to the primary, industrial, and tertiary industrial sectors. (Primary_{t-1} , Industry_{t-1} y Tertiary_{t-1} , respectively). Finally, the variables Group_{t-1} and Export_{t-1} have been added, which indicates whether the firm is in a business group (1) or not (0) and if the firm exports (1) or not (0), respectively.

2.5.2 Pooled linear regression model

The pooled linear regression model is expressed as follows:

$$\log(Sales_{it}) = \beta_1 + \beta_2 \mathbf{Fund}_{it} + \vec{\lambda} \mathbf{X}_{it} + \sum_t^T \delta^t \psi(T = t) + u_{it} \quad (2.5.6),$$

where $Sales_{it}$ represents the sales income (in Chilean pesos for the year 2013) of the firm i in period t , $\psi(T = t)$ is an indicative variable that takes the value 1, if $T = t$. The rest of the variables are the same as presented in Equation (2.3.1) of the growth model.

Since longitudinal models are linear regression models, they must meet the assumptions of normality. Therefore, we apply the logarithm function to provide the fit of our data towards a normal distribution.

The observable units in each of the four rounds are firms and these are identified by their size (microenterprise, small firm, medium-sized firm, and large firm). In turn, the determination of the size of a firm is given by the annual sales revenue (Ministry of Economy, Development and Tourism, 2017).

2.5.3 Fixed effects (FE) model

A first comparison of results is carried out with a fixed effects model. In the fixed effects model, the slopes (coefficient of each independent variable) are constant and the intercept varies for each observation (firm). The term fixed effects is because, although each intercept may vary for each firm, each intercept is time-invariant. Thus, our empirical model is expressed in the following equation:

$$\log(Sales_{it}) = \alpha_i + \beta_2 \mathbf{Fund}_{it} + \vec{\lambda} \mathbf{X}_{it} + \varepsilon_{it} \quad (2.5.7),$$

where the dependent variable is the performance of the firm, measured by the logarithm of sales revenue. $\mathbf{Finan}_{it}$ is the vector that includes all funding categories (specified in Table 2.4.6), $\mathbf{X}_{it}$ corresponds to the vector that contains the control variables, in this case, the characteristics of the firm and α_i is the individual effect of each firm and is constant over time.

2.5.4 Random effects (RE) model

To compare the results of our research, the random effects model will be used. For this, the following specification is given:

$$\log(\text{Sales}_{it}) = \beta_1 + \beta_2 \text{Fund}_{it} + \vec{\lambda} \mathbf{X}_{it} + a_i + u_{it} \quad (2.5.8),$$

where a_i is the individual-specific error component and u_{it} is the random error combining the time series and the cross-sectional component and the explanatory variables are the same as those specified in the fixed effects model.

The explanatory variables used to measure the effects on labor productivity and capital productivity remain consistent across the three-level models (pooled linear regression, fixed effects, and random effects).

2.6 Empirical results

The analysis uses widely recommended methodologies for panel data (Nguyen, 2020; Lin et al., 2020; Parada, 2020), including the fixed effects model and the Generalized Method of Moments (GMM) technique. The Hausman test confirms the superiority of the fixed effects model (p-value = 0.000). The results are presented for three performance measures: sales, labor productivity, and capital productivity.

2.6.1 Effect of funding on sales

To explore the relationship between various funding sources and sales, labor productivity, and capital productivity, our analysis utilizes pooled linear regression, fixed effects (FE), and random effects (RE) models. However, due to superior results in goodness-of-fit measures (R^2) and information criteria (AIC and BIC), we rely primarily on the fixed effects model and the generalized method of moments (GMM) technique. The results for these models are presented in Table 2.6.1.

These hypotheses pertain to funding from suppliers, non-banking institutions, capital, public funding, and bond issuance. For all these sources, the results indicate a significant and positive impact on sales performance.

Focusing on sales performance, the analysis validates hypotheses H2, H3, H4, H7, and H8. These hypotheses pertain to funding from suppliers, non-banking institutions, capital,

public funding, and bond issuance. For all these sources, the results indicate a significant and positive impact on sales performance.

The decision to finance through equity and bond issuance yields the highest positive impact on sales performance. These findings align with those of Nguyen (2020), who demonstrates that formal funding sources, such as bank loans and loans from financial institutions, significantly enhance firm performance. Similarly, the positive influence of public funding on sales aligns with Bertoni et al. (2019) and Alvarez et al. (2023), who highlight the critical role of participatory funding in driving entrepreneurial growth. The low impact of public funding on sales is attributable to a problem of inadequate beneficiary selection (Mardones, 2021). A similar situation occurs with informal financing. Micro and small enterprises are those that most frequently resort to this funding source, obtaining amounts that partially cover their operational costs. Our results further indicate that credit funding substantially boosts sales levels, corroborating the findings of Fan et al. (2023) and Busom and Vélez (2021). Additionally, both internal (equity) and external funding emerge as vital contributors to firm performance, as supported by Kim and Cho (2020) and Álvarez et al. (2023).

Hypothesis 10, which examines the impact of firm characteristics on performance, reveals that all firm characteristics significantly influence sales performance. Notably, firm size has a consistently negative effect across all categories, with microenterprises and small-sized firms experiencing the greatest negative impacts, reducing sales levels by 0.395 and 0.686, respectively.

Table 2.6.1: Regression models for sales

Variable	Model 1	Model 2	Model 3	Model 4	GMM
Sales _{t-1}	0.022 (0.029)	-----	-----	-----	-----
Retail	0.065 (0.341)	0.251*** (0.099)	-0.004 (0.102)	0.122 (0.085)	-0.068 (0.142)
Supplier	0.178** (0.071)	0.9519*** (0.024)	0.404*** (0.021)	0.891*** (0.018)	0.085** (0.043)
No Bank	-0.270** (0.115)	0.712*** (0.041)	0.267*** (0.034)	0.558*** (0.030)	0.106* (0.057)

(Continued)

Table 2.6.1: Regression models for sales (Continued)

Variable	Model 1	Model 2	Model 3	Model 4	GMM
Capital	-0.013 (0.070)	0.1553*** (0.022)	0.546*** (0.019)	1.065*** (0.016)	-0.033 (0.062)
Investors	-0.791 (1.023)	0.457* (0.269)	-0.053 (0.229)	0.252 (0.206)	-0.152 (0.199)
Angel	0.239*** (0.016)	0.029 (0.847)	0.304 (0.473)	0.764* (0.468)	-0.576 (0.572)
Estate	-0.277 (0.331)	0.200* (0.114)	0.159* (0.097)	0.279*** (0.087)	0.119 (0.131)
Bond	0.320 (0.381)	0.513*** (0.175)	0.472*** (0.111)	0.742*** (0.107)	0.388** (0.187)
Informal	0.594** (0.252)	0.204** (0.088)	0.079 (0.090)	0.248*** (0.075)	-0.008 (0.116)
Age	0.091 (0.062)	0.081*** (0.017)	0.068*** (0.016)	0.142*** (0.008)	0.064 (0.066)
Micro	0.440*** (0.197)	0.228*** (0.037)	-0.395*** (0.037)	0.732*** (0.028)	-0.455*** (0.145)
Small	0.176 (0.141)	-0.209*** (0.0253)	-0.686*** (0.026)	0.113*** (0.021)	-0.348** (0.141)
Medium	-0.079 (0.115)	0.605*** (0.036)	-0.106*** (0.032)	0.764*** (0.027)	-0.197* (0.114)
Primary	-0.049 (0.093)	0.363*** (0.031)	0.123*** (0.026)	0.415*** (0.023)	0.158 (0.110)
Industry	0.145 (0.125)	0.271*** (0.052)	0.186*** (0.040)	0.455*** (0.037)	0.011 (0.066)
Group	-0.075 (0.086)	1.279*** (0.027)	0.2964*** (0.024)	1.099*** (0.020)	0.283 (0.305)
Exportation	0.054 (0.117)	0.719*** (0.040)	0.229*** (0.033)	0.569*** (0.029)	-0.500 (0.486)
D (2015)	-----	1.308*** (0.104)	-----	-----	-----
D (2017)	-----	2.192*** (0.073)	-----	-----	-----
D (2019)	-----	2.206*** (0.065)	-----	-----	-----
Constant	2.764*** (0.467)	-0.267*** (0.098)	2.060*** (0.041)	1.026*** (0.022)	3.569* (2.038)
n	4,478	51,061	51,061	51,061	51,061
R ² adjusted	0.004	0.708	0.349	0.626	-----
AIC	20,166	39,706	31,725	-----	-----
BIC	20,320	39,875	31,871	-----	-----
Hausman test, p-value			0.000		

Model 1 is the growth model, Model 2 is pooled linear regression, Model 3 is a fixed effects model, and Model 4 is a random effects model. GMM is the Generalized Method of Moments.

Note 1: Absence of multicollinearity was verified for model 1 without lag (Mean VIF = 1.11; Max VIF = 1.53). Note 2: Standard errors are in parenthesis. ***= sig. at 1%, ** = sig. at 5%, and * = sig. at 10%. Note 3: The panel is unbalanced. Model 1 (growth) uses one observation per firm; Models 2–5 use all available firm-year observations, including firms incorporated in later periods to compensate for attrition.

Conversely, firms within economic groups and those engaging in export activities benefit from positive effects, increasing sales by 0.296 and 0.229, respectively. These trends

are consistent with the findings of Nguyen (2020) and Hottenrott and Richstein (2019). The impact of industrial sector affiliation on sales performance is less pronounced but still notable. Firms operating in the primary sector see sales increases of 0.123, while those in industrialized sectors achieve a slightly higher growth rate of 0.186.

2.6.2. Effect of funding on labor productivity

Following the approach used to analyze sales performance, we now evaluate firm performance in terms of labor productivity. Using Model 3, the results validate hypotheses H2, H3, H4, H7, and H8. This confirms that funding from suppliers, non-banking institutions, equity capital, public funding, and bond issuance all have a significant and positive impact on labor productivity, with respective rates of 0.346, 0.244, 0.451, 0.117, and 0.452 (Table 2.6.2). It should be emphasized that public funding has a limited impact on labor productivity. This can be attributed to the fact that a significant number of selected firms already have R&D departments and, therefore, would have innovated independently of public funds, evidencing the problem of "picking winners" in CORFO programs (Mardones, 2021).

The findings reaffirm that these funding sources substantially enhance labor productivity. Notably, equity capital and bond issuance have the most pronounced effects, each contributing over 45% to labor productivity growth. These results emphasize the critical role of these funding methods in driving efficiency gains. The significant positive impact of public funding and bond issuance on labor productivity is consistent with prior studies, including those by Busom et al. (2017) and Guergo and Moreno (2017), which underscore their importance in enhancing productivity outcomes.

The analysis of control variables reveals that most categories have a significant and positive impact on labor productivity, except for the small business category within the size variable. Small businesses negatively influence labor productivity, with a rate of -0.302. Conversely, microenterprises exhibit a positive effect, contributing to labor productivity at a rate of 0.218. These results suggest that smaller firm sizes generally yield a stronger positive influence on labor productivity. While the size variable overall shows a positive effect on

business performance, the impact is relatively low, as indicated in studies by Lin et al. (2020), Howell (2019), Kim and Cho (2020), and Busom et al. (2020).

Other factors, such as firm age, industrial sector, membership in an economic group, and engagement in export activities, also positively affect labor productivity. Among these, being part of an industrialized sector, belonging to an economic group, and participating in export activities stand out, with coefficients of 0.147, 0.195, and 0.160, respectively. For instance, membership in an economic group enhances labor productivity by 20%, while firms involved in international trade achieve a 16% increase in productivity. These findings align with previous studies, such as those by Nguyen (2022) and Bravo et al. (2023), which highlight the significant role of these factors in driving labor productivity.

Table 2.6.2: Regression models for labor productivity

Variable	Model 1	Model 2	Model 3	Model 4	GMM
Labor productivity $t-1$	0.016 (0.053)	-----	-----	-----	-----
Retail	0.087 (0.299)	0.181** (0.078)	-0.056 (0.088)	0.053 (0.072)	-0.065 (0.139)
Supplier	0.184*** (0.063)	0.745*** (0.019)	0.346*** (0.018)	0.731*** (0.014)	0.119** (0.046)
No Bank	-0.195* (0.104)	0.555*** (0.032)	0.244*** (0.026)	0.470*** (0.024)	0.129** (0.062)
Capital	-0.028 (0.062)	0.902*** (0.017)	0.451*** (0.019)	0.862*** (0.014)	-0.039 (0.067)
Investors	-0.894 (0.932)	0.354* (0.212)	-0.045 (0.107)	0.204 (0.158)	-0.078 (0.246)
Angel	0.173*** (0.014)	0.023 (0.668)	0.187 (0.303)	0.576 (0.447)	-0.855 (0.581)
Estate	-0.106 (0.298)	0.168* (0.090)	0.117* (0.070)	0.216** (0.072)	0.054 (0.129)
Bond	0.345 (0.334)	0.446*** (0.138)	0.452*** (0.095)	0.653*** (0.094)	0.291* (0.177)
Informal	0.452** (0.219)	0.161** (0.069)	0.006 (0.073)	0.168** (0.061)	-0.051 (0.111)
Age	-0.057 (0.056)	0.057*** (0.013)	0.043** (0.019)	0.125*** (0.006)	0.048 (0.069)
Micro	0.308*** (0.118)	0.575*** (0.029)	0.218*** (0.031)	1.073*** (0.021)	0.209 (0.148)
Small	0.123 (0.102)	-0.047** (0.020)	-0.302*** (0.034)	0.295*** (0.022)	0.066 (0.136)

(Continued)

Table 2.6.2: Regression models for labor productivity (Continued)

Variable	Model 1	Model 2	Model 3	Model 4	GMM
Medium	-0.035 (0.095)	0.543*** (0.028)	0.079*** (0.025)	0.745*** (0.021)	0.049 (0.111)
Primary	-0.020 (0.082)	0.309*** (0.024)	0.106*** (0.021)	0.352*** (0.019)	0.174 (0.108)
Industry	0.125 (0.109)	0.232*** (0.041)	0.147*** (0.029)	0.382*** (0.028)	-0.037 (0.075)
Group	-0.094 (0.077)	0.957*** (0.021)	0.195*** (0.024)	0.841*** (0.017)	0.311 (0.228)
Exportation	0.043 (0.105)	0.535*** (0.031)	0.156*** (0.031)	0.427*** (0.024)	-0.590 (0.473)
D2	-----	0.897*** (0.082)	-----	-----	-----
D3	-----	1.677*** (0.058)	-----	-----	-----
D4	-----	1.664*** (0.052)	-----	-----	-----
Constant	0.345 (0.505)	-0.142* (0.077)	1.560*** (0.051)	0.694*** (0.020)	2.098 (2.165)
n	4,478	51,061	51,061	51,061	51,061
R ² adjusted	0.007	0.718	0.507	0.640	
AIC	19,121	32,775	23,100	-----	
BIC	19,237	32,945	23,237	-----	
Hausman test, p-value			0.000		

Source: self-made. Model 1 is the growth model, Model 2 is pooled linear regression, Model 3 is a fixed effects model, and Model 4 is a random effects model. GMM is the Generalized Method of Moments. Note 1: Absence of multicollinearity was verified for model 1 without lag (Mean VIF = 1.11; Max VIF = 1.53). Note 2: Standard errors are in parenthesis. ***= sig. at 1%, ** = sig. at 5%, and * = sig. at 10%. Note 3: The panel is unbalanced. Model 1 (growth) uses one observation per firm; Models 2–5 use all available firm-year observations, including firms incorporated in later periods to compensate for attrition.

2.6.3 Effect of funding on capital productivity

The analysis in Table 2.6.3 presents the estimated coefficients illustrating the impact of funding sources on capital productivity using the fixed effects model (Model 3). Hypotheses H4 and H8 are confirmed, demonstrating that funding through capital and bond issuance significantly enhances capital productivity, with positive effects of 0.145 and 0.526, respectively. Access to own funding increases capital productivity by 15%, while bond issuance achieves a remarkable 53% improvement.

While limited literature directly examines the relationship between funding and capital productivity, some studies explore similar concepts through total factor productivity. Wu et al. (2022) identified a positive correlation between state funding and total factor productivity. Similarly, Wang and Xu (2022) observed that external funding positively influences total factor productivity, particularly in firms that initially resist funding, findings that align with the effects of retail and supplier funding noted in this study. Other research, such as Fernández (2017) and Kim and Cho (2020), highlights positive outcomes of internal funding on business performance.

The influence of firm characteristics on capital productivity appears less pronounced compared to their effects on sales and labor productivity. For small firms, size negatively impacts capital productivity at a rate of -0.123. Conversely, firms in industrialized sectors improve capital productivity by 0.070, and those in economic groups achieve a higher positive rate of 0.128. However, firms engaged in export activities exhibit a slight reduction in capital productivity, with a negative rate of -0.034.

Examining the coefficients from Model 3 across Tables 2.6.2, 2.6.3, and 2.6.4, private funding sources consistently exhibit a stronger impact on firm performance (spanning sales, labor productivity, and capital productivity) compared to state-provided funding. Moreover, the joint analysis in Table 2.6.4 underscores this trend, with positive coefficients affirming that private funding plays a more substantial role in explaining business performance across all three dimensions.

The joint analysis further explores the comparative effects of various funding types on business performance. External funding demonstrates a stronger influence than internal funding on both sales and labor productivity, as shown in the third column of Table 2.6.4. Similarly, the fourth column reveals that formal funding outperforms informal funding across all three performance measures: sales, labor productivity, and capital productivity. Lastly, credit-based funding proves significantly more impactful on labor productivity and capital productivity than funding derived from donations, such as contributions from angel investors and public funding programs.

Table 2.6.3: Regression models for capital productivity

Variable	Model 1	Model 2	Model 3	Model 4	GMM
Capital productivity $t-1$	0.005 (0.006)	-----	-----	-----	-----
Retail	-0.099 (0.080)	0.052 (0.041)	-0.054 (0.075)	0.006 (0.049)	0.787** (0.372)
Supplier	-0.012 (0.016)	0.137*** (0.010)	0.001 (0.012)	0.144*** (0.008)	0.227* (0.120)
No Bank	0.058** (0.026)	0.092*** (0.017)	-0.011 (0.019)	0.073*** (0.013)	0.026 (0.146)
Capital	0.010 (0.015)	0.260*** (0.009)	0.145*** (0.012)	0.287*** (0.008)	-0.095 (0.170)
Investors	0.408** (0.198)	0.138 (0.112)	0.151 (0.123)	0.163* (0.097)	-0.210 (0.563)
Angel	0.016*** (0.003)	0.314 (0.353)	-0.112 (0.172)	0.173 (0.170)	0.753 (1.070)
Estate	0.014 (0.051)	0.126*** (0.048)	0.116 (0.071)	0.136*** (0.047)	0.102 (0.339)
Bond	-0.032 (0.076)	0.537*** (0.073)	0.526*** (0.080)	0.593*** (0.060)	0.625** (0.142)
Informal	0.018 (0.088)	0.083** (0.037)	-0.075 (0.068)	0.064 (0.041)	-0.196 (0.215)
Age	-0.033** (0.014)	-0.022*** (0.007)	-0.006 (0.011)	0.032*** (0.003)	-0.083 (0.178)
Micro	-0.037 (0.027)	0.124*** (0.015)	-0.023 (0.026)	0.312*** (0.015)	-0.089 (0.406)
Small	-0.024 (0.021)	0.017* (0.011)	-0.123*** (0.019)	0.136*** (0.010)	-0.192 (0.412)
Medium	-0.019 (0.022)	0.210*** (0.015)	0.028 (0.021)	0.287*** (0.012)	0.019 (0.308)
Primary	0.017 (0.020)	0.010 (0.013)	0.018 (0.017)	0.072*** (0.012)	-0.331 (0.242)
Industry	-0.010 (0.026)	0.045** (0.022)	0.070*** (0.025)	0.139*** (0.018)	0.175 (0.238)
Group	-0.012 (0.019)	0.363*** (0.011)	0.128*** (0.015)	0.362*** (0.009)	-0.536 (0.459)
Exportation	0.007 (0.025)	0.004 (0.017)	-0.034* (0.019)	0.027** (0.013)	1.364 (0.860)
D2	-----	0.028 (0.043)	-----	-----	-----

(Continued)

Table 2.6.3: Regression models for capital productivity (Continued)

Variable	Model 1	Model 2	Model 3	Model 4	GMM
D3	-----	0.402*** (0.030)	-----	-----	-----
D4	-----	0.360*** (0.027)	-----	-----	-----
Constant	0.066 (0.044)	0.180*** (0.041)	0.512*** (0.028)	0.173*** (0.008)	-4.435 (4.432)
n	4,478	51,061	51,061	51,061	51,061
R ² adjusted	0.005	0.423	0.188	0.348	
AIC	6,551	14,195	1,437	-----	
BIC	6,660	14,365	1,575	-----	
Hausman test, p-value			0.000		

Source: self-made. Model 1 is the growth model, Model 2 is pooled linear regression, Model 3 is a fixed effects model, and Model 4 is a random effects model. GMM is the Generalized Method of Moments. Note 1: Absence of multicollinearity was verified for model 1 without lag (Mean VIF = 1.11; Max VIF = 1.53). Note 2: Standard errors are in parenthesis. ***= sig. at 1%, ** = sig. at 5%, and * = sig. at 10%. Note 3: The panel is unbalanced. Model 1 (growth) uses one observation per firm; Models 2–5 use all available firm-year observations, including firms incorporated in later periods to compensate for attrition.

Table 2.6.4: Joint analysis to measure the effect on performance, according to the type of funding

Performance variable	Private funding versus public funding	Internal funding versus external funding	Informal versus formal funding	Grant funding versus credit funding
Sales	1.856*** (0.564)	-1.189** (0.566)	-2.015*** (0.560)	-0.755 (0.143)
Labor Productivity	1.468*** (0.362)	-0.891** (0.362)	-1.690*** (0.360)	-0.689** (0.345)
Capital Productivity	0.456* (0.248)	-0.094 (0.267)	-0.838*** (0.258)	-0.384* (0.219)

Note 1: Each column refers to the types of funding. Differences have been considered according to the order written in each column of the types of funding.

Note 2: Standard errors are in parenthesis. ***= sig. at 1%, ** = sig. at 5%, and * = sig. at 10%.

Note 3: Values represent differences between coefficients (Wald test) across funding categories, estimated from a log-linear specification (log of the performance variable regressed on binary funding indicators)

2.6.4 Autocorrelation, endogeneity and exogeneity

The assessment of autocorrelation within the models, conducted using the Generalized Method of Moments (GMM) and specifically the Arellano-Bond test, indicates no evidence of first-order (AR (1)) or second-order (AR (2)) autocorrelation. This finding applies consistently across the three performance models. In practical terms, this implies that the performance

measures (sales, labor productivity, and capital productivity) are not influenced by their own prior or future values. Consequently, this absence of autocorrelation supports the suitability of employing longitudinal models to analyze the impact of funding on these performance metrics. The detailed results are presented in Table 2.6.5.

Table 2.6.5: Autocorrelation, endogeneity, and exogeneity tests for the three performance models

	Sales	Labor productivity	Capital productivity
Arellano-Bond AR(1) test, p-value	0.464	0.382	0.108
Arellano-Bond AR(2) test, p-value	0.508	0.439	0.783
Hansen test (endogeneity), p-value	0.236	0.197	0.942
Hansen test (exogeneity), p-value	0.227	0.141	0.874

The Arellano-Bond test for serial autocorrelation in the residuals in the first differences tests the nullity of no autocorrelation in the first differences in the residuals. The Hansen test (exogeneity) tests the null hypothesis that the full set of instruments is jointly valid, i.e., uncorrelated with the error term. The Hansen test (endogeneity) reports the difference-in-Hansen statistic, which tests the null hypothesis that the subset of instruments associated with the funding variables—the regressors most likely subject to reverse causality—is also exogenous, conditional on the validity of the remaining instruments.

Regarding endogeneity, the Hansen test across the three performance models indicates no presence of endogeneity. This result ensures that the selected explanatory variables (funding sources) are appropriate and reliable for the analysis. To further validate this, the Hansen test for exogeneity confirms that the funding variables used in the models for sales, labor productivity, and capital productivity are indeed exogenous.

The GMM estimators provide evidence of causality for the explanatory variables. First, in the context of sales performance, the GMM results confirm that supplier funding, non-bank funding, and bond-based funding directly influence sales outcomes (Table 2.6.2). Second, these same funding sources are also positively associated with labor productivity (Table 2.6.3). Finally, the GMM estimators reveal that only bond-based funding has a direct and significant effect on capital productivity (Table 2.6.4).

When assessing the effect of funding variables on firm performance, there is a possibility that firms with higher performance may have better access to various funding sources. For instance, banks and suppliers may extend more credit to firms with higher sales revenue, which would imply an endogeneity problem arising from reverse causality. However,

evidence shows that financing is a cause of performance. Bağır and Seven (2022) confirm that financial constraints decrease firm productivity. Tingbani et al. (2024) show that trade credit causes firm growth. As in our research, both authors use GMM to test their results. We have included the results of the Generalized Method of Moments (GMM) technique in tables 2.6.3, 2.6.4, and 2.6.5. This can be explore in future research.

2.7 Conclusion

This study investigates the impact of various funding sources on the performance of Chilean firms, spanning four survey periods between 2013 and 2019. The analysis encompasses micro, small, medium, and large firms, using a range of funding options including bank loans, retail funding, supplier credit, non-bank funding, capital contributions, investors, angel investors, state funding, bond issuance, and informal funding. Firm performance is assessed through three key variables: sales, labor productivity, and capital productivity, with firm characteristics - such as age, size, and industrial sector - serving as control variables. To quantify the effects of funding on performance, four econometric models were employed.

The findings reveal that firm performance, whether measured by sales, labor productivity, or capital productivity, improves significantly with funding from own resources (capital) and bond issuance. This underscores the importance for firms to leverage internal financial resources or secure long-term debt through bond markets to maintain sustainability. Additionally, sales performance and labor productivity are positively influenced by supplier credit, non-bank funding, and public funding, highlighting the diverse impacts of these funding sources.

In terms of effect size, the fixed-effects estimates preferred by the Hausman test show that bond issuance and equity (capital) funding have the largest significant impacts across the three performance measures: sales increase by 0.472 and 0.546, labor productivity by 0.452 and 0.451, and capital productivity by 0.526 and 0.145 (log points), respectively. Supplier credit and non-banking funding follow, raising sales by 0.404 and 0.267 and labor productivity by 0.346 and 0.244, though neither is significant for capital productivity. These magnitudes are broadly consistent with, but somewhat larger than, those reported by Nguyen (2020) and

Busom and Vélez (2021) for formal credit sources and clearly exceed the effects of public funding documented by Bertoni et al. (2019) and Álvarez et al. (2023), suggesting that in the Chilean context internal and long-term formal financing play a comparatively stronger role than participatory or public instruments. Capital productivity remains the least sensitive outcome, with only bond issuance and equity funding reaching significance, a pattern not previously examined at this level of disaggregation (Bravo et al., 2023; Giner et al., 2017), which reinforces the value of disaggregating funding sources rather than relying on the broad internal and external or formal and informal classifications used in prior studies (Kim and Cho, 2020; Huergo and Moreno, 2017)

While prior studies have examined the relationship between funding and firm performance (e.g., Bertoni et al., 2019; Santi and Santoreli, 2017; Kim and Cho, 2020), this research distinguishes itself by disaggregating funding into specific categories, providing a granular understanding of their individual effects. Unlike prior studies that group funding into broad categories - such as internal versus external, formal versus informal, or public versus private (Kim and Cho, 2020; Nguyen, 2020; Huergo and Moreno, 2017) - this study extends the analysis to demonstrate how private, external, and formal funding play crucial roles in the Chilean context.

An important contribution of this research lies in its focus on labor productivity and capital productivity, performance measures that are seldom explored in the literature (Bravo et al., 2023; Giner et al., 2017). These measures are critical to understanding firm efficiency, and identifying the financial determinants behind them offers valuable insights for strategic decision-making in both public and private sectors.

The study acknowledges some limitations. First, the dataset covers only four periods, as the surveys were conducted biannually from 2013 to 2019. Future research can expand this analysis with additional rounds from the Longitudinal Business Survey (ELE) as they become available. Second, the scope of control variables was restricted, excluding managerial characteristics (e.g., gender, education, experience, and leadership) and technological factors. Future studies could investigate how these additional variables influence sales, labor productivity, and capital productivity.

This research provides relevant information for public policy decision-making and corporate strategy design. For public policymakers, the findings highlight the need to develop differentiated funding programs that consider the heterogeneity of businesses, specifically in relation to economic sector and firm size. In particular, governments should consider establishing targeted funding programs that reduce barriers to formal funding for micro and small businesses, which often face greater difficulties in accessing bank credit. Furthermore, evidence on the differential impacts of funding sources suggests that public policies should create targeted support instruments for businesses.

For private firms, this research highlights the importance of strategic funding decisions as determinants of medium- and long-term business performance. Therefore, business leaders should evaluate not only the cost of capital but also the strategic implications of different funding sources on productive performance, growth, and financial stability. Micro and small businesses should also consider diversifying their sources of funding to reduce their dependence on single sources such as informal funding or short-term debt, as these can limit growth opportunities. Finally, medium-sized and large firms should explore capital market alternatives such as bond issuance and equity placement, as this research shows a low share of these sources of funding.

For future studies, we recommend delving deeper into the relationship between funding and performance by analyzing labor and capital productivity across firms of different sizes. This approach could yield more targeted insights into how various funding sources impact micro, small, medium, and large enterprises, enabling tailored strategies for financial and operational improvement. This decomposition would reveal whether certain sources of funding primarily improve labor productivity or capital productivity. Such performance measures would allow policymakers to design public support programs that address specific productivity constraints. Furthermore, future research should investigate non-random attrition in the results. We leave this for future exploration.

Capítulo 3

Determinants of Funding Access and Capital Structure: Evidence from Chilean Companies

3.1 Abstract

Access to financing is a determining factor in business growth, particularly for micro and small enterprises, whose inherent characteristics may limit access. Although extensive literature exists on business financing access, most studies focus exclusively on small and medium-sized enterprises, leaving a gap in understanding how different business categories access and structure their capital. This paper examines the impact of firm size, return on assets, tangibility, and other organizational characteristics on financing decisions and capital structure, considering three categories: external private financing, external public financing, and internal financing. Using a sample of 28,361 Chilean firms from the Longitudinal Survey of Chilean Enterprises (2013-2022), differentiated patterns were analyzed according to firm size and their effects on leverage and debt. The results reveal that micro and small enterprises prefer external financing to internal financing, whereas medium and large firms show the opposite tendency. Likewise, total assets demonstrate a positive impact on leverage with an average rate of 34%. This analysis extends the understanding of financing access by incorporating medium and large firms, contributing to the debate on capital structure determinants in emerging economies.

Keywords: funding, capital structure, indebtedness, firm size, tangibility.

3.2 Introduction

Firms' access to funding to run their business is a popular topic in the literature, as its study helps to better understand how companies make their decisions and heterogeneities among firms' performance (Arora and Mukherjee, 2023; Bauer et al., 2024; Wang et al., 2023; Nguyen and Canh 2021; Jansen et al., 2023). Both internal and external factors affect firms' funding decisions (Kieschnick and Moussawi, 2018; Cao and Leung, 2020). Among these internal factors are labor productivity and firm growth (Motta, 2020), as well as components

inherent to firms' capital and debt structures (Jansen et al., 2023). Regarding external factors, literature has paid more attention to economic shocks, given the economic uncertainty that they generate. Examples are the 2007-2008 crisis (Demirgüç-Kunt et al., 2020; D'Amato, 2020) and the COVID-19 crisis of 2020 (Gopalakrishnan et al., 2022; Wellalage et al., 2022).

Generally, funding sources can be internal or external¹ (Mota, 2020; Manaresi and Pierri, 2024), formal, and informal² (Fiamohe et al., 2024; Bertoni and Colombo, 2023; Pham and Phan, 2020; Mutsonziwa and Fanta, 2021). Larger firms have greater access to credit than their smaller counterparts (Pham and Phan, 2020). Smaller firms are the most constrained in terms of internal financial resources and face greater restrictions when accessing external credit markets, particularly during periods of heightened uncertainty (Cowling et al., 2024). Note that financing constraints may reduce labor productivity and hinder greater firm participation in the economy, especially for small and medium-sized enterprises (Motta, 2020).

To understand what constrains access to funding, it is necessary to examine firms' capital structures and the variables that explain their conditions. In this regard, Abdullah and Tursoy (2021) link firms' financial performance to capital structure. The authors find that financial performance and leverage can positively affect each other, while capital structure can negatively affect market performance. Kieschnick and Moussawi (2018) establish an association between firm age, corporate governance, and capital structure. Specifically, they find that the greater the managers' power, the lower the firm's debt as it ages. Other studies incorporate exogenous factors such as economic environments related to capital structure. For instance, D'Amato (2020) demonstrates that Italian SMEs' capital structure during the global financial crisis (2008-2009) was based on short-term debt, and that financial leverage is primarily determined by profitability, liquidity, asset tangibility, and firm risk.

Prior research has examined associations between firms' capital structure and board composition. García and Herrero (2021) indicate that gender diversity on boards of European

¹ External financing sources include commercial banks, trade credit from suppliers, non-bank financial institutions, or informal channels. Internal sources are derived from firms' own funds.

² Formal financing sources comprise commercial banks, regulated non-bank financial institutions, and government entities. Informal sources are derived from family, friends, and unregulated lenders.

firms reduces the probability of bankruptcy, leverage, the cost of debt, and debt maturity. Alves et al. (2015) conclude that firms with boards composed of independent directors (directors who do not hold executive positions in the company) rely more on external funding sources compared to retained earnings. As firms age, the constraints of their corporate bylaws and board composition influence capital structure decisions very differently than when firms are young (Kieschnick & Moussawi, 2018).

Much of the prior research on financing and capital structure focuses on small and medium-sized enterprises in Europe, North America, and Asia (D'Amato, 2020; Wang, 2023; Demirgüç-Kunt et al., 2020; Jansen, 2023) or on samples of large firms (Kieschnick and Moussawi, 2018; García, 2021; Abdullah and Tursoy, 2021; Alves et al., 2015), with more limited evidence from Latin American developing economies. While some studies have identified determinants of financing and capital structure across firms of different sizes, a gap remains in the literature regarding whether the firm characteristics that significantly affect these financial decisions exhibit the same magnitude and direction of effect across micro, small, medium-sized, and large enterprises. In this context, we analyze financing decisions and capital structure in Chilean firms across all size categories. Our objective is to identify not only the explanatory variables of financing access and capital structure, but also to determine whether their effects differ systematically by firm size. To this end, we employ probit regression models (Lo Mónaco et al., 2024; Wellalage et al., 2022; Lin et al., 2025; Gopalakrishnan et al., 2022) and fixed-effects linear regression models (Alves et al., 2015; Demirgüç-Kunt et al., 2020; D'Amato, 2020; Kalantonis et al., 2021).

The remainder of this paper is organized as follows. Section 2 reviews important contributions in the field. Section 3 describes the data and sample construction, presents summary statistics, and defines the variables of interest, the empirical methodology, and the model specification. Section 3 presents and discusses the estimation results, main findings, and their implications. Section 4 offers concluding remarks.

3.3 Methods

3.3.1 Theoretical framework and literature review

Several studies have examined the impact of financial ratios and firm characteristics on access to funding. For instance, Jansen et al. (2023), applying multinomial logit regression to a sample of 277 family firms, find that liquidity, profitability, and characteristics such as firm age and size have significant impacts on access to funding. Using a fixed effects model on a sample of Chinese firms listed on the Shenzhen and Shanghai stock exchanges between 2009 and 2021, Huang et al. (2023) find that promoting corporate innovation, improving social reputation, and mitigating operational risk facilitate access to funding. Similarly, the size of the entrepreneurial team directly impacts crowdfunding for European entrepreneurial ventures (Lo Mónaco et al., 2024).

Fazzari et al. (1988) indicate that export activity, size (measured by total assets), and innovation are firm characteristics that facilitate access to financing. They find that capital market imperfections make external funding particularly costly for firms with greater information asymmetries, such as young firms, small enterprises, or those with limited credit history. On the other hand, Stiglitz and Weiss (1981) argue that banks face adverse selection and moral hazard problems that prevent them from distinguishing with certainty between good and bad borrowers. As a result, lenders may ration credit rather than adjust interest rates, leaving demand unmet even when borrowers are willing to pay higher rates. These theories are consistent with the empirical work of Vergara et al. (2023) and Dumitru and Dumitru (2024), who include variables such as credit history and export activities that facilitate access to financing. In this context, we propose the following hypothesis:

H1: Firm export activities have a positive effect on access to external funding.

This hypothesis is based on the premise that export activity generates foreign currency cash flows, diversifies market risks, and signals better management quality and greater competitive capacity to the financial system, thereby reducing information asymmetries (Fazzari et al., 1988).

Financial indicators such as the debt ratio (total liabilities to total assets) and financial leverage constitute relevant variables for analyzing access to private financing (Huang et al., 2023; Lin et al., 2025). In this regard, Huang et al. (2023) find that financial leverage positively affects access to trade credit. Examining the pecking order in funding decisions, Jansen et al. (2023) document that firms prioritize internal financing, followed by bank debt, family equity, and finally external equity. These authors validate their findings using logit regression models applied to a sample of Belgian firms.

This hierarchical preference order is grounded in Pecking Order Theory (Myers and Majluf, 1984), which posits that firms establish a financing hierarchy driven by information asymmetries between managers and external investors. According to this theory, firms prioritize using internal funds, then resort to debt financing, and, as a last resort, issue equity. Based on this theoretical framework, we propose the following hypotheses:

H2: Microenterprises and small enterprises prioritize external funding over internal financing.

H3: Medium-sized and large firms prioritize internal financing over external funding.

The proportion of men and women on the board of directors, the proportion of board members who do not hold executive positions in the company, the size of the board of directors, and their effects on capital structure have also been studied in several investigations. Alves et al. (2015), using fixed effects models on a sample of companies located in Europe, Asia, Africa, and America, demonstrate that a board of directors composed of independent members has riskier funding sources in its capital structure. Similarly, the percentage of women on the board of directors negatively affects leverage, the cost of debt, and default risk (García y Herrero, 2021). Meanwhile, Kieschnick and Moussawi (2018) highlight that firm age is negatively correlated with debt levels, and as the firm ages, it resorts to less costly funding sources.

The empirical findings on the composition of the board of directors, the participation of women in managerial roles, and firm age find theoretical support in Agency Theory (Jensen and Meckling, 1976) as applied to capital structure, analyzing conflicts between shareholders and managers, and between shareholders and creditors. One of the main findings of this theory

is that managers can obtain private benefits at the expense of outside shareholders. As a complement to this theory, Jensen (1986) proposes that debt acts as a disciplinary mechanism that reduces the agency costs of free cash flow by committing the firm's future cash flows to interest payments. In this context, the following hypotheses are proposed:

H4: Firm age has a negative effect on the firm's financial leverage.

H5: A higher proportion of women in managerial positions is associated with lower firm leverage.

Previous research has also linked financial ratios with firm performance measures (Abdullah and Tursoy, 2021; Hussain et al., 2021; Yu et al., 2022). For example, D'Amato (2020) finds that profitability, liquidity, and asset tangibility significantly affect short-term debt. Meanwhile, asset tangibility is the main factor that significantly affects the long-term debt ratio. In their conclusions, Abdullah and Tursoy (2021) highlight a positive association between financial leverage³ and the financial performance⁴ of publicly traded companies.

The following is a summary of the articles analyzed regarding the central topic of this study. It is worth noting that a large portion of this research related to access to financing has been conducted in Europe, Africa, the United States, and Asia, while studies on this subject remain limited in Latin America. This same trend can be observed in research analyzing the determinants of financial leverage and financial debt (Table 3.3.2), as well as in studies addressing capital structure. This situation can be clearly seen in Tables 3.3.1, 3.3.2, and 3.3.3.

³ Financial leverage is defined as the ratio of total debt to the book value of total assets (Abdullah and Tursoy, 2021).

⁴ Financial performance (ROA) is defined as the ratio of earnings before interest and taxes to the book value of total assets (Abdullah and Tursoy, 2021).

Table 3.3.1: Summary of Funding Determinants. Key Findings

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Alves et al. (2015)	Fixed effects	Internal, external funding sources (disaggregated according to capital structure)	Percentage of independent directors, percentage of women on the board, board size, director duality, firm growth, sales, asset depreciation and country.	Countries in Europe, Asia, Africa, Russia, USA, and Brazil.	Companies with a board composed of more independent directors are more likely to have higher fractions of riskier funding sources in their capital structures.
Wellalage et al. (2022)	Probit	Probability of access to external funding.	Ten environmental indicators of companies and the characteristics of the firm and its owners.	Developing thirteen countries.	Strong environmental performance by companies increases access to external funding during the pandemic.
Gopalakrishnan et al. (2022)	Probit	Debt financing.	Government measures to prevent COVID-19, government bonds, communication of work teams, country, assets (total), liquidity/assets and leverage, among others.	Countries in: Europe, Asia, Africa, America, and Oceania.	The degree of funding needs is strongly associated with the degree of containment measures adopted by governments during the pandemic.
Jansen et al. (2023)	Multinomial logit	Incremental funding decision.	Liquidity (liquid assets/total assets). Profitability (earnings/total assets). Size (log (total assets)). Age (log (age)). Risk, tax rate, socioemotional wealth, family status (has it or does not have it) and manager (family or non- family)	Belgium	External funding is preferred, followed by bank debt, family capital, and external equity. Families privilege internal financing over external funding.

(Continued)

Table 3.3.1: Summary of Funding Determinants. Key Findings (Continued)

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Huang et al. (2023)	Fixed effects	Trade credit financing.	Debt ratio, corporate growth, firm size, and equity nature.	China	Firm performance, by promoting innovation, improving social reputation, and mitigating operational risk, facilitates access to funding
Dumitru and Dumitru (2024)	Binary logit	Probability of suffering credit constraints.	Firm characteristics, public support, firm profits, and credit history.	EU countries	The probability of suffering credit constraints decreases with the increase in firm size. Financial performance is significant for credit constraints.
Lo Mónaco et al. (2024)	Probit model	Number of investors, capital raised, probability of success.	Size of entrepreneurial team, firm age, firm size, firm location (London)	U K	The size of an entrepreneurial team directly impacts equity crowdfunding financing.
Lin et al. (2025)	Probit model	Probability of initiating firm securitization.	Firm performance. Accounts payable. Firm ratios. Firm age. Firm size. Type of firm (government linked or non-linked)	China	Firm performance has a direct, generally negative impact on the probability of issuing securitizations, and the type of ownership plays a crucial role in the decision to initiate asset-backed securitizations.

Source: Own elaboration based on references therein.

Table 3.3.2: Summary of the Determinants of Leverage and Debt. Key Findings

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Kieschnick and Moussawi (2018)	Fractional regression model	Market value leverage measure.	Board size, firm age, dual class shares, total assets and others	United States	Firm age is negatively correlated with corporate debt. As firms mature, they resort to lower-cost external funding sources.
Demirgüç- Künt et al. (2020)	Fixed effects and generalized least squares	Total debt to total assets. Long-term debt to total assets. Long- term debt to total debt.	2008 - 2009 crisis, 2010 - 2011 crisis, firm characteristics and firm ratios, such as fixed assets to total assets.	Low- income, middle- income, and high- income countries.	The 2008 - 2009 crisis led to a decrease in corporate leverage during the 2010 - 2011 period. This was associated with a reduction in long-term funding.
D'Amato (2020)	Fixed effects model	Leverage.	Asset structure, profitability, firm risk, growth opportunities, firm size, liquidity, pre- crisis and post- crisis periods.	Italy	Corporate financial leverage is primarily determined by profitability, liquidity, asset tangibility, and firm risk. While asset tangibility, liquidity, and profitability significantly affect the short - term debt ratio, asset tangibility is the primary factor affecting the long - term debt ratio.
García and Herrero (2021)	Binary logit regression	Bankruptcy risk. Leverage.	Gender diversity on the board of directors, governance characteristics and firm characteristics	European Union	The percentage of women on the board of directors negatively reduces leverage, cost of debt, and default risk.
Abdullah and Tursoy (2021)	Generalized method of moments (GMM)	Firm performance (ROA) and Leverage.	Stock price, ROA, leverage, firm growth rate, firm size.	Germany	There is a positive association between leverage and the financial performance of publicly traded companies. Stock price is negatively affected by capital structure. Moreover, both ROA and stock price can positively influence capital structure.

(Continued)

Table 3.3.2: Summary of the Determinants of Leverage and Debt. Key Findings (Continued)

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Kalantonis et al. (2021)	Fixed effects model	Leverage.	ESI (Economic Sentiment Indicator), ROA, size (log (total assets)), sales/total assets.	Greece	There is a preference for internal financing over external debt. Macroeconomic factors have a negative effect on leverage (2005- 2018).
Hussain et al. (2021)	Static and dynamic regression. Analysis with interactive effects	Gross profit	Gross income on total assets, type of exchange, number of outstanding sales days, recovery cycle per collection, macroeconomic indicators, firm size, firm age, short - term and long - term debt as a percentage of total assets.	Pakistan	The firm does not efficiently control its current assets and liabilities using accounting plans. Firm size has a significant effect on gross profit. Firm size has an adverse relationship with firm performance.

Source: Own elaboration based on references therein.

Table 3.3.3: Summary of Performance Measures and Capital Structure. Key Findings

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Abdullah and Tursoy (2021)	Generalized method of moments (GMM)	ROA, ROE, Stock price.	Capital structure, current ratio, firm growth rate, dividend payout ratio and firm size.	Germany	There is a positive association between financial performance and capital structure in German publicly traded firms.
Legesse et al. (2021)	Panel tobit regression	Probability of surviving or going bankrupt	Financial indicators, investment, debt, firm size, firm growth.	China, Japan, and United States	Firms that use more debt capital have higher probabilities of surviving, but also higher probabilities of bankruptcy.

(Continued)

Table 3.3.3: Summary of Performance Measures and Capital Structure. Key Findings
(Continued)

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Petrovito and Pozzolo (2021)	Probit	Probability of exporting, Export propensity over total sales.	Financial restrictions, growth, number of employees, labor productivity, firm age, and percentage of skilled workers.	Emerging and developing countries	Firms that use more debt capital have higher probabilities of surviving, but also higher probabilities of bankruptcy.
Yu et al. (2022)	Fixed effects model	Total factor productivity.	Value of bank loans, total factor productivity ratio, property credit guarantee, firm size, firm growth, GDP growth.	China	Obtaining a credit guarantee positively impacts total factor productivity. Property credit guarantees can efficiently increase both the probability and prior amounts.
Arora and Mukherjee (2022)	Static and dynamic regression models	Probability of exporting and probability of continuing to export.	Firm characteristics, maturity, financial and political environment.	India	The greater a country's financial development, the higher the probability of survival for firms that depend on external funding for their operations.
Kljucnikov et al. (2023)	Normality tests	Executives' perception of the firm's financial situation.	Gender, age, orientation, education and country	Czech Republic, Slovakia, and Hungary	Czech and Slovak executives' perceptions of firms' financial situations differ. Whereas Slovak executives have a more positive financial perception.
Vergara et al. (2023)	Probit model	Probability that firms participate in governmental programs (Total R&D expenditure over sales)	Firm characteristics: age, size, export activity, multinational (>50%)	México	Public funding (support programs) has a positive effect on total R&D expenditure, measured both in absolute values and as a percentage of sales value.

(Continued)

Table 3.3.3: Summary of Performance Measures and Capital Structure. Key Findings
(Continued)

Author(s) (year)	Models used	Dependent variable	Independent variables	Geographic scope	Main findings
Akcigit et al. (2024)	Probit model and fixed effects model	Probability of credit default and firm performance (employment , sales and default)	Firm characteristics and the impact of a public program.	Turkey	The program's impact is greater among medium-sized firms, and is greater in economic sectors with higher labor intensity.
Hogrebe and Lutz (2024)	Logit model	Decision to invest or not (binary variable)	Capital invested ratio, monitoring time, age of investment funds, and firm characteristics.	United States	The amount of capital invested, along with monitoring intensity, significantly increases the probability of continued investment.

Source: Own elaboration based on references therein.

3.3.2 Data sources and descriptive evidence

We use five waves of the Longitudinal Enterprise Survey (ELE) published by the Chilean Ministry of Economy for the years 2013, 2015, 2017, 2019, and 2022. This survey collects comprehensive information on firm characteristics, financial structure, employment, sales, and access to financing for Chilean enterprises across different size categories and economic sectors. Two important aspects of this longitudinal survey (2013-2022) are worth highlighting. First, it includes formal businesses ranging from microenterprises to large corporations. Second, the survey covers four domains: firm characteristics, accounting and finance, human resources, and customer and supplier markets. In each wave, a portion of the sample is retained while new firms are simultaneously added.

Given that the primary focus of this research is on funding, we consider it important to present the proportion of each funding source utilized by firms according to their size. Table 3.3.4 consolidates information from the five rounds and shows that the funding sources with

the greatest participation among firms overall are bank financing, supplier credit, internal resources, and funding from related companies. It can also be observed that the total percentages exceed one hundred percent. This is because firms can draw on more than one funding source. Generally, we observe that the most common funding sources are bank credits, capital increases, and suppliers. The representativity varies across firm's sizes.

Table 3.3.4: Distribution of Funding by Firm Size (%)

Type of Funding	Microenterprise	Small enterprise	Medium-size firm	Large Firm	Total
Bank financing	8.5	17.1	11.8	34.2	71.6
Retail	0.5	0.6	0.1	0.1	1.3
Suppliers	2.9	8.0	7.1	22.5	40.4
Finance companies	0.4	1.7	2.2	6.9	11.2
Crowdfunding	0.0	0.0	0.0	0.0	0.0
Venture capital	0.0	0.1	0.0	0.1	0.2
Stockbrokers	0.0	0.0	0.0	0.0	0.0
Internal resources, capital increase	7.4	14.1	8.6	26.9	57.0
Related companies	0.3	1.0	2.0	9.1	12.4
Public funding	0.3	0.4	0.2	0.4	1.3
Bond issuance	0.0	0.0	0.0	0.6	0.6
Informal sources	0.9	0.7	0.2	0.2	2.0
Angel investors	0.0	0.0	0.0	0.0	0.0
Microfinance institutions	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.3	0.2	1.1	1.8
No funding source	3.0	3.2	0.9	1.8	8.9
Total firms (n)	4759	8300	5041	10261	28361

Note: According to the source from the Chilean Ministry of Economy, Development, and Tourism, firms are defined as: (a) microenterprise, those whose annual income from sales and services and other activities does not exceed 2400 UF in the last calendar year; (b) small firm, those whose annual income exceeds 2400 UF but is less than 25000 UF; (c) medium-sized firm, those whose annual income exceeds 25000 UF but is less than 100000 UF; and (d) large firm, those whose annual income exceeds 100000 UF. (1 UF corresponds to 39237 Chilean pesos as of June 2025).

3.3.2.1 Funding and capital structure variables

Funding is categorized into three types: external private financing, external public funding, and internal financing. Each of these categories groups eight funding sources. There is information about these types of funding and categories in the five waves of the ELE used. Private external financing includes bank financing, retail, finance companies, suppliers, related companies, and informal financing. Public external funding considers only funding provided by the State through different mechanisms. Lastly, internal financing includes the company's

own resources. Table 3.3.5 defines the dependent variables and explanatory variables used in this paper.

Table 3.3.5: Variables definitions

Variable	Definition
Dependent variables	
Private external financing	The source of financing comes from banks, suppliers, retail, related companies, or informal sources.
Public external funding	The source of funding comes from the State.
Internal financing	The source of financing comes from the company's own resources.
Leverage	Debt / Equity
Debt ratio	Debt / Total assets
Explanatory variables	
Tangibility	Fixed assets / Total assets
ROA	Log (Net income / Total assets)
Age	Age of the company. Considered from the start of its formal activity.
Firm size	Logarithm of total assets
Economic sector	Set of dichotomous variables indicating the main sector in which the company operates. The categories grouping the activities are: a) Natural resource extraction. b) Manufacturing industry. c) Electricity, gas, and water supply. d) Construction. e) Trade. f) Transportation and storage. g) Services (accommodation and food service activities, information and communications, financial and insurance activities, administrative and support services, real estate activities, professional, scientific, and technical activities) h) Other services (artistic, entertainment, and recreational activities – other service activities)
Group	Whether the company belongs to an economic group.
Exports	Whether the company engages in export activities.
Male managers	Number of men holding managerial positions in the company.
Female managers	Number of women holding managerial positions in the company.
Source: Own elaboration. Variable definitions are from the Longitudinal Survey of Enterprises of Chile (INE).	

Table 3.3.6 specifies the nomenclature of the dependent and explanatory variables, along with a description of each. Table 3.3.7 shows the means and standard deviations of each variable, segmented by firm size.

Table 3.3.6: Variables description

Explained Variables	Description
PREF: Private external financing	= 1 if the firm had private external financing and 0 otherwise.
PEF: Public external funding	= 1 if the firm had public external funding and 0 otherwise.
INTF: Internal financing	= 1 if the firm had internal financing and 0 otherwise.
LEV: Leverage	= $\text{Log} ((\text{Short-term debt} + \text{Long-term debt}) / \text{Equity})$
DEB: Debt ratio	= $(\text{Short-term} + \text{long-term debt}) / \text{Total assets}$
Explanatory Variables	Description
SIZE: Size	= $\text{Log} (\text{Total assets})$
ROA: Return on assets	= $\text{Net income} / \text{Total assets}$
TANG: Tangibility	= $\text{Fixed assets} / \text{Total assets}$
AGE: Age	= $\text{Firm age} (\log)$
GROUP: Group	= 1 if the firm belongs to a business group and 0 otherwise.
EXP: Export	= 1 if the firm exports and 0 otherwise.
MGEN: Male managers	= Proportion of male managers.
FGEN: Female managers (baseline)	= Proportion of female managers.
Economic sector	The sector in which the firm conducts its main activity.
MANUF: Manufacturing	= 1 if the firm engages in manufacturing activities and 0 otherwise.
CONST: Construction	= 1 if the firm belongs to the construction sector and 0 otherwise.
TRADE: Trade	= 1 if the firm belongs to the trade sector and 0 otherwise.
TRANSP: Transportation	= 1 if the firm belongs to the transportation sector and 0 otherwise.
OTHER: Others	= 1 if the firm is in another economic sector.

Source: Own elaboration based on references therein.

Regarding access to private external financing, we observe that it increases with firm size: microenterprises record a mean of 0.596, while large firms record 0.760, indicating greater ease of access to credit for larger-scale enterprises. Conversely, the debt ratio exhibits an inverse pattern with size, being higher in microenterprises (0.816) and progressively decreasing to 0.603 in large firms. Leverage presents a marked difference, with negative values in microenterprises (-0.982) that become positive and increase up to 0.548 in large firms, reflecting distinct capital structures. Regarding the explanatory variables, firm size (measured as the logarithm of assets) varies from 10.498 in microenterprises to 16.354 in large firms. Notably, small enterprises' return on assets (ROA) is negative (- 2.227), the lowest among all categories, whereas large firms have the highest ROA at 4.392, suggesting greater profitability.

Table 3.3.7: Variables and basic statistics by firm categories

Firm categories		Microenterprise		Small enterprise		Medium-sized firm		Large firm	
Explained variables		MD	SD	MD	SD	MD	SD	MD	SD
Private external financing	=	0.596	0.491	0.681	0.466	0.765	0.424	0.760	0.427
Public external funding	=	0.021	0.143	0.013	0.113	0.011	0.105	0.007	0.086
Internal financing	=	0.480	0.500	0.449	0.497	0.441	0.497	0.464	0.499
Leverage	=	-0.982	2.594	-0.434	2.398	0.106	2.097	0.548	1.754
Debt ratio	=	0.816	13.872	6.688	5.001	0.601	6.787	0.603	3.751
Explanatory variables									
Size	=	10.498	1.864	12.139	1.653	14.275	1.556	16.354	2.050
ROA	=	3.8678	5.6612	-2.2267	4.2159	-0.9580	3.7865	4.3918	6.4766
Tangibility	=	0.334	0.717	0.388	0.732	0.374	0.434	0.304	0.347
Age	=	1.029	0.373	1.079	0.334	1.133	0.306	1.202	0.315
Group	=	0.027	0.161	0.061	0.240	0.230	0.421	0.484	0.500
Export	=	0.016	0.127	0.042	0.201	0.096	0.294	0.240	0.427
Male managers	=	0.102	0.296	0.297	0.432	0.537	0.444	0.615	0.387
Female managers (baseline)	=	0.074	0.254	0.108	0.274	0.149	0.275	0.196	0.265
Economic sector									
Manufacturing	=	0.085	0.279	0.114	0.318	0.069	0.253	0.136	0.343
Construction	=	0.096	0.295	0.090	0.286	0.100	0.299	0.083	0.276
Trade	=	0.178	0.383	0.120	0.325	0.182	0.385	0.276	0.447
Transportation	=	0.089	0.284	0.084	0.277	0.062	0.241	0.075	0.264
Others		0.057	0.233	0.082	0.274	0.047	0.212	0.017	0.128
Numbers of observation	=	4,759		8,300		5,041		10,261	

Source: Own elaboration based on references therein.

3.3.3 Empirical model

We estimate two types of regression models. Access to funding is examined using nonlinear probit models for each of the three funding categories, and capital structure is examined using linear regression models with fixed effects. This analysis is conducted across several subsamples based on firm size.

3.3.3.1 Probit regression model

Given that the dependent variables in funding access are binary (private external financing, public external funding, and internal financing), we use probit regression models as in various studies that estimate funding categories (Lo Mónaco et al., 2024; Lin et al., 2025;

Wellalage et al., 2022; Gopalakrishnan et al., 2022). The estimated models are presented in equations (3.3.3.1), (3.3.3.2), and (3.3.3.3) as follows.

$$P (PREF_{it} = 1 | \mathbf{X}) = \Phi (\alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 ROA_{it} + \alpha_3 TANG_{it} + \alpha_4 AGE_{it} + \alpha_5 GROUP_{it} + \alpha_6 EXP_{it} + \alpha_7 MGEN_{it} + \alpha_8 MANUF_{it} + \alpha_9 CONST_{it} + \alpha_{10} TRADE_{it} + \alpha_{11} TRANSP_{it} + \alpha_{12} OTHER_{it}) \quad (3.3.3.1)$$

$$P (PEF_{it} = 1 | \mathbf{X}) = \Phi (\beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 TANG_{it} + \beta_4 AGE_{it} + \beta_5 GROUP_{it} + \beta_6 EXP_{it} + \beta_7 MGEN_{it} + \beta_8 MANUF_{it} + \beta_9 CONST_{it} + \beta_{10} TRADE_{it} + \beta_{11} TRANSP_{it} + \beta_{12} OTHER_{it}) \quad (3.3.3.2)$$

$$P (INTF_{it} = 1 | \mathbf{X}) = \Phi (\gamma_0 + \gamma_1 SIZE_{it} + \gamma_2 ROA_{it} + \gamma_3 TANG_{it} + \gamma_4 AGE_{it} + \gamma_5 GROUP_{it} + \gamma_6 EXP_{it} + \gamma_7 MGEN_{it} + \gamma_8 MANUF_{it} + \gamma_9 CONST_{it} + \gamma_{10} TRADE_{it} + \gamma_{11} TRANSP_{it} + \gamma_{12} OTHER_{it}) \quad (3.3.3.3)$$

where $PREF_{it}$, PEF_{it} , $INTF_{it}$ are binary variables that equal 1 if firm i at time t accessed private external financing, public external funding, and internal financing, respectively, and 0 otherwise. Φ , denotes the cumulative distribution function of the standard normal distribution (probit link function). Vector $\mathbf{X}$ contains the explanatory variables included in each model, as described in Table 3.3.5. The parameters $\alpha_1, \dots, \alpha_{12}$, $\beta_1, \dots, \beta_{12}$, and $\gamma_1, \dots, \gamma_{12}$ capture the marginal effects of each explanatory variable on the probability of accessing private external financing, public external funding, and internal financing, respectively.

3.3.3.2 Fixed effects (FE) regression model

Using the fixed-effects model, we examine the relationship between firms' financial leverage and the same set of explanatory variables used in the previous probit estimations. Likewise, we analyze firms' debt ratios following the same methodological approach.

The fixed effects model specifications for each dependent variable are presented below:

$$\log (LEV_{it}) = \delta_i + \lambda_t + \delta_1 SIZE_{it} + \delta_2 ROA_{it} + \delta_3 TANG_{it} + \delta_4 AGE_{it} + \delta_5 GROUP_{it} + \delta_6 EXP_{it} + \delta_7 MGEN_{it} + \delta_8 MANUF_{it} + \delta_9 CONST_{it} + \delta_{10} TRADE_{it} + \delta_{11} TRANSP_{it} + \delta_{12} OTHER_{it} + u_{it} \quad (3.3.3.4)$$

$$\begin{aligned} \log(\text{DEB}_{it}) = & \theta_1 + \varepsilon_t + \theta_1 \text{SIZE}_{it} + \theta_2 \text{ROA}_{it} + \theta_3 \text{TANG}_{it} + \theta_4 \text{AGE}_{it} + \theta_5 \text{GROUP}_{it} + \theta_6 \text{EXP}_{it} \\ & + \theta_7 \text{MGEN}_{it} + \theta_8 \text{MANUF}_{it} + \theta_9 \text{CONST}_{it} + \theta_{10} \text{TRADE}_{it} + \theta_{11} \text{TRANSP}_{it} + \\ & \theta_{12} \text{OTHER}_{it} + v_{it}, \end{aligned} \quad (3.3.3.5)$$

where the dependent variable LEV_{it} represents the firm's leverage and DEB_{it} represents the firm's debt ratio, calculated as follows:

$$\text{LEV}_{it} = \frac{\text{Short-term debt}_{it} + \text{Long-term debt}_{it}}{\text{Equity}_{it}} \quad (3.3.3.6)$$

$$\text{DEB}_{it} = \frac{\text{Short-term debt}_{it} + \text{Long-term debt}_{it}}{\text{Total assets}_{it}}, \quad (3.3.3.7)$$

where λ_t and ε_t account for the temporal effects, and $\delta_1, \dots, \delta_{12}$ and $\theta_1, \dots, \theta_{12}$ represent the coefficients capturing the effect of each explanatory variable on leverage and debt ratio, respectively.

It is important to clarify that the five estimation models are applied independently to each firm size category (micro, small, medium-sized, and large firms) to measure the effects on both financing access and capital structure.

3.4 Results

To measure the effects on access to different funding categories, we employ probit models (Wellalage et al., 2022). Tables 8, 9, and 10 report the results for access to external private financing, public funding, and internal financing, respectively. To assess the effects on leverage and debt ratios, we use fixed-effects models; the results are presented in Tables 11 and 12.

3.4.1 Effects on external private financing

Table 3.4.1 shows that firm size is positively associated with access to external private financing across all four firm categories. However, asset tangibility has a greater impact on

access to external private financing, except for medium-sized firms. Regarding firm age, we find that as firms mature, they turn to lower-cost financing sources (Kieschnick and Moussawi, 2018). Membership in a business group, a characteristic predominantly found in medium-sized and large firms, negatively affects access to external private financing ($\beta = -0.457$, $p < 0.01$; $\beta = -0.284$, $p < 0.01$, respectively). This finding suggests that, given their economic capacity, these firms can accumulate more retained earnings and therefore prefer internal over external financing (Myers and Majluf, 1984). The construction and manufacturing sectors largely explain access to external private financing, particularly for medium-sized and large firms.

Table 3.4.1: Probit Regression to Measure the Effect on Access to External Private Financing (beta coefficients)

Variable	Microenterprise	Small enterprise	Medium-sized firm	Large firm
Size	0.034 (0.017) **	0.068 (0.014) ***	0.054 (0.023) ***	0.0187 (0.010) **
ROA	0.022 (0.001) ***	0.034 (0.000) ***	0.008 (0.000) ***	0.039 (0.000) ***
Tangibility	0.238 (0.075) ***	0.035 (0.039)	0.248 (0.091) ***	0.266 (0.057) ***
Age	-0.207 (0.081) ***	-0.091 (0.066) *	-0.2507 (0.096) ***	-0.100 (0.051) **
Group	0.0314 (0.203)	-0.394 (0.086) ***	-0.457 (0.072) ***	-0.284 (0.034) ***
Export	0.061 (0.235)	0.249 (0.109) **	0.154 (0.095) *	0.075 (0.037) **
Male managers	0.322 (0.107) ***	0.250 (0.049) ***	0.202 (0.061) ***	0.303 (0.041) ***
Manufacturing	-0.075 (0.100)	0.077 (0.065)	0.134 (0.101) *	0.094 (0.064) *
Construction	0.039 (0.100)	0.075 (0.069)	0.274 (0.099) ***	0.193 (0.073) ***
Trade	-0.250 (0.087) ***	0.119 (0.065) **	0.150 (0.085) **	0.095 (0.063) *
Transportation	-0.231 (0.105) **	0.103 (0.070) *	0.045 (0.101)	-0.153 (0.069) **
Others	-0.358 (0.113) ***	-0.227 (0.069) ***	-0.326 (0.122) ***	-0.246 (0.106) ***
D_2017	0.641 (0.085) ***	0.103 (0.052) **	0.230 (0.073) ***	0.146 (0.044) ***
D_2019	0.618 (0.097) ***	0.242 (0.058) ***	0.286 (0.080) ***	0.324 (0.051) ***
D_2022	1.588 (0.095) ***	1.095 (0.063) ***	1.278 (0.117) ***	1.449 (0.099) ***
Constant	-0.616 (0.207) ***	-0.548 (0.175) ***	-0.063 (0.322)	0.305 (0.167) **
n	4,759	8,300	5,041	10,261
Pseudo R ²	0.144	0.078	0.095	0.070
Log pseudolikelihood	-1284.168	-2707.870	-1439.100	-4547.196

Note 1: Standard errors are in parentheses. *** = sig. at 1%, ** = sig. at 5%, * = sig. at 10%.

Note 2: ROA expressed in percentage points rather than as a decimal proportion.

3.4.2 Effects on public funding

Table 3.4.2 shows that, for large firms, most explanatory variables exhibit significant coefficients. Specifically, size, age, export activity, and belonging to the transportation sector have positive effects on access to public funding ($\beta = 0.075$, $p < 0.01$; $\beta = 0.363$, $p < 0.05$; $\beta = 0.185$, $p < 0.05$; $\beta = 0.243$, $p < 0.10$, respectively). In contrast, the manufacturing and

commerce sectors show negative effects ($\beta = -0.261$, $p < 0.10$ and $\beta = -0.380$, $p < 0.05$, respectively). For micro and medium-sized firms, both the commerce and transportation sectors exhibit negative impacts on access to public funding. Regarding manager gender, we observe that in small and medium-sized firms, having a male manager facilitates access to this type of funding. Overall, the commerce, manufacturing, and construction sectors have heterogeneous effects on access to funding provided by public programs across different firm size categories (Akcigit et al., 2024).

Table 3.4.2: Probit Regression to Measure the Effect on Access to Public Funding
(beta coefficients)

Variable	Microenterprise	Small enterprise	Medium-sized firm	Large firm
Size	-0.036 (0.034)	0.016 (0.030)	0.015 (0.048)	0.075 (0.028) ***
ROA	-0.031 (0.000) ***	0.004 (0.001) ***	0.016 (0.000) ***	0.002 (0.000) ***
Tangibility	0.095 (0.092)	-0.205 (0.133) *	-0.254 (0.175) *	-0.056 (0.113)
Age	-0.096 (0.179)	-0.051 (0.164)	0.137 (0.217)	0.363 (0.181) **
Group	0.451 (0.367)	-0.207 (0.252)	-0.138 (0.199)	-0.062 (0.107)
Export	0.314 (0.463)	0.108 (0.250)	0.048 (0.261)	0.185 (0.107) **
Male managers	-0.083 (0.262)	0.231 (0.112) **	0.283 (0.133) **	0.100 (0.114)
Manufacturing	-0.308 (0.218) *	-0.330 (0.196) *	0.043 (0.232)	-0.261 (0.167) *
Construction	0.210 (0.113) **	0.189 (0.250)	0.206 (0.410)	0.196 (0.590)
Trade	-0.458 (0.190) **	-0.873 (0.331) ***	-0.445 (0.225) **	-0.380 (0.163) **
Transportation	-0.581 (0.285) **	-0.385 (0.225) **	-0.441 (0.348)	0.243 (0.159) *
Others	-0.006 (0.214)	0.583 (0.135) ***	0.799 (0.395) **	0.438 (0.217) **
D_2017	0.773 (0.347) **	0.321 (0.137) ***	-0.143 (0.215)	0.132 (0.127)
D_2019	0.565 (0.371) *	0.052 (0.176)	0.301 (0.158) **	0.121 (0.135)
D_2022	0.984 (0.343) ***	0.358 (0.135) ***	0.162 (0.159)	0.222 (0.132) *
Constant	-2.142 (0.486) ***	-2.487 (0.348) ***	-2.730 (0.737) ***	-4.162(0.497) ***
n	4,759	8,300	5,041	10,261
Pseudo R ²	0.068	0.142	0.120	0.091
Log pseudolikelihood	-194.187	-309.166	-211.361	-392.758

Note 1: Standard errors are in parentheses. *** = sig. at 1%, ** = sig. at 5%, * = sig. at 10%.

Note 2: ROA expressed in percentage points rather than as a decimal proportion.

3.4.3 Effects on internal financing

The results presented in Table 3.4.3 highlight the positive effects of firm size, ROA, and firm age. For microenterprises, age appears to be an obstacle to financing with internal funds ($\beta = -0.277$, $p < 0.01$). In contrast, for large firms, age tends to be an advantage ($\beta = 0.173$, $p < 0.01$), whereas tangibility does not ($\beta = -0.105$, $p < 0.05$); this latter finding

contradicts that obtained by Camisón et al. (2022). Regarding economic sectors, it is observed that medium-sized and large manufacturing firms prefer not to finance themselves with internal resources ($\beta = -0.260$, $p < 0.05$ and $\beta = -0.112$, $p < 0.10$, respectively). Comparable patterns are found for medium-sized firms in the commerce and transportation sectors ($\beta = 0.214$, $p < 0.01$ and $\beta = 0.235$, $p < 0.05$, respectively).

Across all cases where effects on the three types of financing are measured, some coefficients of the ROA variable are observed to be very low and close to zero, although statistically significant. However, due to their small magnitude, they lack empirical relevance or practical significance.

Table 3.4.3: Probit Regression to Measure the Effect on Access to Internal Financing (beta coefficients)

Variable	Microenterprise	Small enterprise	Medium-sized firm	Large firm
Size	0.008 (0.016)	0.016 (0.014)	0.051 (0.024) **	0.028 (0.010) ***
ROA	0.001 (0.000) ***	0.021 (0.000) ***	0.012 (0.035)	0.004 (0.000) ***
Tangibility	0.119 (0.069) **	-0.024 (0.049)	0.024 (0.057)	-0.105 (0.051) **
Age	-0.277 (0.075) ***	0.086 (0.073)	0.100 (0.095)	0.173 (0.055) ***
Group	-0.227 (0.192)	-0.022 (0.093)	-0.158 (0.076) **	0.048 (0.036)
Export	0.322 (0.236) *	0.041 (0.112)	-0.041 (0.091)	0.048 (0.038)
Male managers	0.144 (0.099) *	-0.009 (0.051)	0.025 (0.060)	0.041 (0.043)
Manufacturing	-0.066 (0.095)	-0.074 (0.071)	-0.260 (0.103) ***	-0.112 (0.066) **
Construction	-0.041 (0.093)	0.152 (0.074) **	-0.013 (0.092)	0.041 (0.075)
Trade	-0.075 (0.083)	-0.068 (0.071)	-0.214 (0.081) ***	-0.060 (0.064)
Transportation	-0.060 (0.098)	0.062 (0.076)	-0.235 (0.112) **	-0.044 (0.073)
Others	0.096 (0.106)	0.094 (0.073)	-0.146 (0.117)	0.028 (0.116)
D_2017	-0.254 (0.081) ***	0.154 (0.059) ***	0.032 (0.072)	0.109 (0.043) ***
D_2019	-0.297 (0.093) ***	0.089 (0.063) *	-0.103 (0.079) *	-0.014 (0.045)
D_2022	-0.173 (0.085) **	0.143 (0.057) **	0.075 (0.073)	0.230 (0.047) ***
Constant	0.373 (0.198) **	-0.553 (0.187) ***	-0.910 (0.342) ***	-0.854 (0.170) ***
n	4,759	8,300	5,041	10,261
Pseudo R ²	0.016	0.006	0.014	0.010
Log pseudolikelihood	-1516.758	-2438.974	-1591.484	-4601.493

Note 1: Standard errors are in parentheses. *** = sig. at 1%, ** = sig. at 5%, * = sig. at 10%.

Note 2: ROA expressed in percentage points rather than as a decimal proportion.

Based on the results presented and analyzed in Tables 3.4.1, 3.4.2, and 3.4.3, the first hypothesis can be validated (H1: A firm's export activities have a positive effect on access to external funding). This relationship is primarily observed among large firms which possess greater physical infrastructure and higher profitability to support export activities. Statistical

evidence of this is reflected in the positive, significant effect this variable has on access to both external private and public funding. In Table 3.4.3, the effect of this variable on access to internal financing is significant only for microenterprises.

The second hypothesis (H2: For micro and small enterprises, external funding is preferred over internal financing) is supported by the significance and signs of the coefficients for the variables size, ROA, and tangibility, primarily for microenterprises. However, this accessibility is limited to external private financing and does not extend to public funding. This can be attributed to the low liquidity these firms generate, which renders them heavily dependent on bank debt.

Regarding the third hypothesis (H3: For medium-sized and large enterprises, internal financing is preferred over external funding), the evidence provides only partial support. For both firm categories, significant results are observed exclusively for external private financing, and medium-sized firms do not exhibit significant variables explaining access to public funding. This suggests that the hypothesis's prediction of a preference for internal financing is not clearly supported by our data.

Regarding the possible endogeneity in the probit regressions (Tables 3.4.1 to 3.4.3), it is important to note that these dependent variables are binary, which means that a probit model with firm-level fixed effects is not appropriate: this type of nonlinear specification with individual fixed effects suffers from the incidental parameters problem (Neyman and Scott, 1948), which generates inconsistent estimators when the panel has a limited number of periods per firm. For this reason, following common practice in the capital structure literature, unobserved heterogeneity was controlled for using industry and year fixed effects, rather than firm fixed effects.

3.4.4 Effects on firm leverage

Across all four firm categories, size is a significant variable, with a positive effect on leverage; the magnitude of impact consistently ranges from 31.7% to 36%. This finding confirms the Pecking Order theory (Myers & Majluf, 1984), which posits that larger firms, with greater collateral and stronger credit reputations, access bank debt more readily.

Conversely, microenterprises remain excluded from institutional funding due to insufficient collateral and relatively higher transaction costs. However, this pattern does not hold for tangibility, ROA, and age in large firms, as their effects on leverage are substantial and negative ($\beta = -0.390$, $p < 0.01$; $\beta = -0.377$, $p < 0.01$; and $\beta = -0.521$, $p < 0.01$, respectively). Table 3.4.4 summarizes these results.

Table 3.4.4: Fixed Effects Regression to Measure the Effect on Firm Leverage

Variable	Microenterprise	Small enterprise	Medium-sized firm	Large firm
Size	0.317 (0.187) **	0.332 (0.115) ***	0.320 (0.165) **	0.360 (0.062) ***
Tangibility	0.299 (0.195) *	-0.138 (0.178)	-0.007 (0.099)	-0.390 (0.119) ***
ROA	-0.001 (0.002)	-0.004 (0.001) ***	-0.065 (0.025) ***	-0.377 (0.146) ***
Age	-0.198 (0.838)	0.007 (0.444)	0.943 (0.477) **	-0.521 (0.140) ***
Group	0.903 (0.683) *	0.089 (0.268)	0.032 (0.198)	0.033 (0.053)
Export	1.393 (0.240) ***	-0.079 (0.235)	-0.049 (0.156)	-0.027 (0.066)
Male managers	-0.255 (0.389)	0.163 (0.139)	0.048 (0.140)	-0.006 (0.057)
Manufacturing	0.744 (1.142)	-0.713 (0.543) *	-0.355 (0.245) *	0.202 (0.186)
Construction	0.709 (0.858)	-0.696 (0.577) *	-0.429 (0.379)	-0.037 (0.291)
Trade	-0.310 (0.581)	-0.851 (0.468) **	0.171 (0.262)	0.088 (0.187)
Transportation	2.137 (0.965) **	-0.322 (0.630)	-0.540 (0.370) *	0.495 (0.308) *
Others	-0.554 (0.690)	-0.769 (1.503)	-0.421 (0.427)	-0.297 (0.376)
D_2017	0.167 (0.423)	-0.155 (0.112) *	-0.108 (0.121)	-0.186 (0.042) ***
D_2019	-0.076 (0.449)	-0.344 (0.149) **	-0.456 (0.137) ***	-0.228 (0.049) ***
D_2022	-0.094 (0.552)	-0.885 (0.179) ***	-0.882 (0.186) ***	-0.384 (0.064) ***
Constant	-4.468 (2.006) **	-3.678 (1.428) ***	-5.220 (2.312) **	-4.636 (0.036) ***
n	4,759	8,300	5,041	10,261
Adjusted R ²	0.692	0.726	0.780	0.722
VIF	1.48	1.29	1.30	1.69

Note: Standard errors are in parentheses. *** = sig. at 1%, ** = sig. at 5%, * = sig. at 10%.

3.4.5 Effects on firm debt ratio

For micro and small enterprises, firm size negatively affects the debt ratio ($\beta = -0.256$, $p < 0.05$; $\beta = -0.226$, $p < 0.05$), indicating that as these firms grow and develop, their debt levels decline. This pattern reverses for large firms, where size positively influences the debt ratio ($\beta = 0.103$, $p < 0.01$). Tangibility demonstrates significant positive effects on debt ratio for micro and medium-sized enterprises ($\beta = 0.421$, $p < 0.01$ and $\beta = 0.161$, $p < 0.01$, respectively), suggesting that a higher proportion of fixed assets relative to total assets increases debt financing for these firm categories. Return on assets (ROA) is statistically

significant for large firms but exhibits minimal practical impact on the debt ratio, whereas firm age shows a negative relationship ($\beta = -0.177$, $p < 0.01$). In contrast, medium-sized enterprises show a positive association between age and the debt ratio ($\beta = 0.897$, $p < 0.01$), with older firms carrying higher levels of indebtedness. Regarding industry classification, the transportation sector emerges as a particularly relevant factor, especially for microenterprises ($\beta = 2.390$, $p < 0.01$). Table 3.4.5 summarizes these results.

Table 3.4.5: Fixed Effects Regression to Measure the Effect on Firm Debt Ratio

Variable	Microenterprise	Small enterprise	Medium-sized firm	Large firm
Size	-0.256 (0.114) **	-0.226 (0.105) **	0.037 (0.087)	0.103 (0.025) ***
Tangibility	0.421 (0.142) ***	0.114 (0.128)	0.161 (0.050) ***	-0.009 (0.046)
ROA	0.000 (0.000)	0.000 (0.000)	0.106 (0.152)	0.000 (0.000) ***
Age	-0.158 (0.794)	0.066 (0.341)	0.897 (0.297) ***	-0.177 (0.057) ***
Group	0.779 (0.512) *	-0.004 (0.136)	0.074 (0.104)	0.027 (0.027)
Export	0.802 (0.272) ***	0.259 (0.199) *	0.001 (0.086)	-0.004 (0.035)
Male managers	-0.049 (0.357)	0.089 (0.091)	0.028 (0.067)	0.020 (0.024)
Manufacturing	1.163 (0.898) *	-0.114 (0.410)	-0.172 (0.126) *	0.095 (0.062) *
Construction	1.061 (0.778) *	-0.432 (0.458)	-0.225 (0.182)	0.151 (0.098) *
Trade	0.018 (0.494)	-0.560 (0.373) *	0.047 (0.139)	0.047 (0.076)
Transportation	2.390 (0.760) ***	0.013 (0.592)	-0.423 (0.184) **	0.260 (0.090) ***
Others	-0.249 (0.678)	-0.219 (1.047)	-0.557 (0.241) **	-0.024 (0.138)
D_2017	0.548 (0.313) *	-0.064 (0.076)	-0.067 (0.065)	-0.043 (0.018) **
D_2019	0.512 (0.337) *	-0.140 (0.111)	-0.276 (0.083) ***	-0.069 (0.020) ***
D_2022	0.610 (0.436) *	-0.473 (0.138) ***	-0.522 (0.110) ***	-0.113 (0.028) ***
Constant	-4.849 (5.911)	1.431 (1.284)	9.635 (18.004)	-2.284 (0.409) ***
n	4,759	8,300	5,041	10,261
Adjusted R ²	0.999	0.677	0.999	0.722
VIF	1.43	1.27	1.31	1.69

Note: Standard errors are in parentheses. *** = sig. at 1%, ** = sig. at 5%, * = sig. at 10%.

We find partial support for the fourth hypothesis (H4: Firm age has a negative effect on the firm's debt ratio), as it holds only for large firms. However, the hypothesis is rejected for medium-sized enterprises and remains inconclusive for micro and small enterprises due to a lack of statistical significance. Regarding the fifth hypothesis (H5: A higher proportion of men in managerial positions is associated with greater firm indebtedness), the results reveal no statistically significant association between the proportion of male managers and debt ratio across any firm category ($p > 0.1$ in all cases). This finding suggests that in the Chilean context, capital structure decisions are driven primarily by firm-specific factors such as size, tangibility, and profitability, rather than by the gender composition of the managerial team.

3.5 Discussion

This study examines the determinants of funding access and capital structure in Chilean firms, classified into micro, small, medium-sized, and large enterprises, over the period 2013 - 2022. Using probit models to analyze funding access and fixed-effects models to assess the effects on debt ratios and indebtedness levels, we test five hypotheses that reveal heterogeneous patterns in corporate financial decisions across firm size categories. The findings confirm that firm size, asset tangibility, profitability, and industry characteristics constitute key determinants that operate differentially across the four firm categories, providing partial support for the Pecking Order theory (Myers & Majluf, 1984).

The first hypothesis, which posits a positive effect of export activities on access to external funding (both private and public), is supported primarily for large firms. For small and medium-sized enterprises, however, export activity exhibits a positive impact exclusively on external private financing. This finding suggests that exporting firms, through greater market diversification and enhanced management standards, present more favorable profiles to financial institutions and public funding programs. In contrast, export activity is significant only for internal financing among microenterprises, highlighting the structural barriers that constrain smaller firms' access to external credit.

The second and third hypotheses examine funding preferences across firm size categories. The findings confirm that microenterprises and small enterprises rely heavily on external private financing, as evidenced by the positive, significant coefficients for asset size and tangibility. This reliance stems from their limited capacity to generate retained earnings, compelling them to seek bank credit. Conversely, medium-sized and large firms demonstrate greater access to internal financing sources. Notably, however, evidence of public funding utilization among micro, small, and medium-sized enterprises remains weak, suggesting that public funding programs should be strengthened to better serve these underrepresented business segments.

This limited access to public funding among micro and small enterprises (MSE) may be driven by several structural factors. First, public funding programs typically require formal documentation, credit history, and administrative capacity that MSE often lack, creating an

implicit barrier despite these firms being eligible. Second, the fixed transaction and application costs associated with public programs are proportionally higher for smaller loan amounts, discouraging MSE from applying. Third, information asymmetries and limited financial literacy may prevent these firms from being aware of available public instruments. Finally, unlike large firms (which often have dedicated administrative staff to manage grant and subsidy applications), MSE's resource constraints may lead them to prioritize faster, more accessible private financing over the longer approval processes typical of public funding

The fourth hypothesis, which proposes a negative effect of firm age on financial leverage, is partially validated. For large firms, age has a negative, highly significant impact on leverage, suggesting that mature firms prefer to finance themselves with accumulated internal resources, consistent with the Pecking Order theory (Myers & Majluf, 1984). However, for medium-sized enterprises, the effect is contrary: greater age, greater leverage. This situation can be explained by the need that medium-sized enterprises have to finance their operational expansion over time. For micro and small enterprises, the relationship is not statistically significant, reflecting that in these segments, access to credit is more determined by collateral (physical assets) than by firm seniority. These results emphasize that the heterogeneity of firm sizes and the business life cycle affects capital structure decisions.

The fifth hypothesis, regarding the effect of gender in management on leverage, does not receive empirical support across any firm category. The lack of statistical evidence suggests that, in this research, capital structure decisions are more influenced by traditional financial factors (size, profitability, tangibility, and economic sector) than by gender composition in managerial positions.

The findings of this study provide empirical evidence on the validity of Pecking Order theory in emerging economies with heterogeneous business structures. While the theory predicts that firms will prefer internal financing over debt and debt over equity issuance, our results show that this funding hierarchy operates differently across firm sizes. Microenterprises depend fundamentally on short-term bank debt, whereas large firms, with greater bargaining power and capacity to retain earnings, prioritize internal resources.

From a public policy perspective, the results show the need to design differentiated funding instruments. Micro and small enterprises require public support programs and facilitation in accessing these programs, given that they depend on external funding but face access restrictions due to high credit evaluation costs. Medium-sized enterprises need funding lines that recognize their growth phase. For large enterprises, public funding should focus on innovation and market entry, rather than on working capital, given their ready access to commercial banking.

This study has several limitations that should be considered when interpreting the results. First, the analysis period (2013 - 2022) includes external factors such as the pandemic, whose social effects began at the start of 2020 and ended in mid-2022, and the social uprising, initiated in October 2019, which suggests that usual funding patterns may have been altered. Second, the sample is limited to companies that report information to the Financial Market Commission (CMF), excluding smaller companies that do not trade on the stock exchange and that may exhibit different dynamics. The absence of data, such as the amounts requested for each funding category, prevents a more accurate evaluation of access conditions beyond a binary (yes/no) classification.

Future research should address several extensions. First, analyze the interaction between gender and other characteristics of the management team (age, professional training, previous experience) through interaction models. Second, for the case of large companies, corporate governance variables such as independence of the management team and the existence of audit committees, in order to capture better effects on capital structure. Finally, replicate the analysis in other Latin American countries with similar business structures. This will allow evaluating the generalization of the findings, taking into account the institutional contexts of each country.

Capítulo 4

Conclusión

Las preguntas que guiaron esta investigación fueron las siguientes: ¿cuál es el efecto de las fuentes de financiamiento sobre el desempeño empresarial? y ¿cómo influyen las características de la empresa en el acceso al financiamiento y en la estructura de capital? Además de dar respuesta a estas interrogantes, se sostiene que los resultados obtenidos y su respectivo análisis contribuyen a cubrir vacíos no abordados por trabajos previos. En primer lugar, la medición del efecto de las fuentes de financiamiento sobre la productividad del capital. En segundo lugar, la incorporación de ratios financieros y de la variable sexo en la gerencia de la empresa como determinantes del acceso al financiamiento y de la estructura de capital, respectivamente. Finalmente, este estudio se desarrolla en un contexto latinoamericano, en donde existen poca literatura sobre financiamiento a empresas. Para el logro de los objetivos propuestos en esta tesis, las cinco rondas de la ELE y los modelos de efectos fijos y probit constituyeron un insumo clave para el desarrollo de la investigación.

Los dos estudios presentados en esta investigación abordan, desde perspectivas complementarias, el desempeño de las empresas y el acceso al financiamiento. El primero analiza el impacto de distintas fuentes de financiamiento sobre el desempeño de las empresas - medido a través de las ventas, productividad laboral y productividad del capital - durante el período 2013-2019, utilizando cuatro rondas de la Encuesta Longitudinal de Empresas (ELE) del Ministerio de Economía Fomento y Turismo de Chile. El segundo examina los determinantes del acceso al financiamiento y la estructura de capital de las empresas durante cuatro rondas entre el periodo 2013 – 2022 de la ELE.

Ambos estudios convergen en destacar el rol central de los recursos propios y las fuentes de financiamiento formal en el desempeño y la sostenibilidad empresarial. El primer estudio demuestra que el financiamiento con capital propio y la emisión de bonos mejoran significativamente las tres dimensiones de desempeño analizadas, lo que destaca la importancia de las fuentes internas y de la deuda de largo plazo en mercados de capitales. En línea con estos hallazgos, el segundo estudio confirma que las empresas medianas y grandes

priorizan el financiamiento interno, consistente con la teoría de la Jerarquía de Preferencias, mientras que las microempresas y pequeñas empresas dependen de manera relevante del crédito bancario externo, dado que su capacidad de generar utilidades retenidas es más limitada. Esta diferenciación por tamaño es un hallazgo robusto y transversal a ambas investigaciones.

Un aporte relevante de ambas investigaciones es la evidencia sobre el financiamiento público y las brechas de acceso que persisten en el ecosistema empresarial chileno. El primer estudio demuestra que el financiamiento público influye positivamente sobre las ventas y la productividad laboral, mientras que el segundo advierte que la utilización de fondos públicos entre micro, pequeñas y medianas empresas sigue siendo débil, lo que sugiere que los programas existentes no logran alcanzar de manera efectiva a los segmentos que más los necesitan. Estos resultados, tomados en conjunto, apuntan a una brecha entre la oferta de instrumentos públicos de apoyo y la capacidad de las empresas de menor tamaño para acceder a ellos, debido tanto a los costos de evaluación crediticia como a las barreras administrativas.

Ambos estudios refuerzan la idea de que las decisiones de financiamiento y su impacto sobre el desempeño no son homogéneos a lo largo del tejido empresarial. La edad y el tamaño de las firmas condicionan tanto el acceso a las distintas fuentes como los efectos que estas generan sobre la productividad y el endeudamiento. En particular, el segundo estudio evidencia que la antigüedad tiene un efecto negativo sobre el apalancamiento en grandes empresas - coherente con la acumulación de recursos internos a lo largo del tiempo - mientras que en empresas medianas el efecto es inverso, dado que estas requieren financiamiento externo para sostener su expansión operativa. Estos patrones sugieren que el ciclo de vida empresarial es una dimensión analítica que debe incorporarse en el diseño de políticas públicas y estrategias corporativas.

Desde la perspectiva de política pública, los resultados de ambas investigaciones son coincidentes en la necesidad de diseñar instrumentos diferenciados que reconozcan la heterogeneidad del sector empresarial. Para las microempresas y pequeñas empresas, se requieren programas que reduzcan las barreras de acceso al crédito formal y que fortalezcan los mecanismos de financiamiento público, dadas las restricciones estructurales que enfrentan.

Para las empresas medianas, las políticas deberían contemplar líneas de financiamiento que reconozcan su fase de crecimiento y expansión. Para las grandes empresas, el apoyo público debería orientarse hacia la innovación y la internacionalización, ámbitos en los que el financiamiento privado no siempre cubre la totalidad de las necesidades estratégicas. Al momento de evaluar, una política de financiamiento empresarial efectiva debe considerar el tamaño, el sector y el ciclo de vida de las empresas.

Ambas investigaciones señalan la ausencia de variables relacionadas con las características de los equipos directivos - como género, formación y experiencia - y con factores tecnológicos, lo que limita la comprensión integral de los determinantes del desempeño y la estructura de capital. La agenda de investigación futura debería profundizar en el análisis desagregado por tamaño de empresa, incorporar variables de gobernanza corporativa, explorar la atrición no aleatoria en los datos longitudinales y extender el análisis comparativo a otros países de América Latina con estructuras empresariales similares, a fin de evaluar la generalización de los hallazgos en distintos contextos institucionales.

A pesar de los aportes señalados, esta tesis presenta limitaciones empíricas específicas que abren espacio para investigaciones futuras. En primer lugar, la ELE excluye a empresas informales y a microempresas sin empleados registrados, por lo que los resultados sobre acceso al financiamiento no son extrapolables a ese segmento. En segundo lugar, los modelos de efectos fijos y probit utilizados, si bien controlan por heterogeneidad no observada invariante en el tiempo, no resuelven completamente la posible endogeneidad entre las decisiones de financiamiento y el desempeño empresarial. Para complementar, se utiliza la prueba de Hansen aplicada a los tres modelos de desempeño. En tercer lugar, el período analizado (2013-2019 en el primer estudio y 2013-2022 en el segundo) no permite capturar de manera completa los efectos de shocks recientes, como la pandemia del COVID-19 y sus consecuentes cambios en las condiciones de acceso al crédito, sobre las relaciones estudiadas.

En esta línea, futuras extensiones de este trabajo podrían incorporar rondas más recientes de la ELE, una vez disponibles, para evaluar si los patrones de financiamiento identificados se mantienen o se modifican tras la pandemia. Asimismo, sería valioso complementar los modelos con estrategias de identificación causal más robustas, como

variables instrumentales para las fuentes de financiamiento, y explorar el rol de fuentes informales de financiamiento (familiares, prestamistas, proveedores) no capturadas en la encuesta, pero que la literatura sugiere son relevantes para las micro y pequeñas empresas. Finalmente, sería interesante incluir variables explicativas más actuales y que guarden relación con el uso de inteligencia artificial y plataformas online, sobre todo para medir el desempeño en microempresas.

Referencias

Abdullah, H., & Tursoy, T. (2021). Capital structure and firm performance: A panel causality test. <https://mp.ra.ub.uni-muenchen.de/105871/>

Abdullah, H., & Tursoy, T. (2021). Capital structure and firm performance: Evidence of Germany under IFRS adoption. *Review of Managerial Science*, 15(2), 379-398. <https://doi.org/10.1007/s11846-019-00344-5>

Akcigit, U., Seven, Ü., Yarba, İ., and Yılmaz, F. (2024). Firm-level impact of public credit guarantees. *European Economic Review*, 170, 104861. <https://doi.org/10.1016/j.eurocorev.2024.104861>

Álvarez, L., Arcaya, G., Cueto, F., and de la Torre, R. (2023). Can public credit programs improve artisanal fisher performance? The case of FONDEPES a credit program. *Marine Policy*, 156, 105792. <https://doi.org/10.1016/j.marpol.2023.105792>

Alves, P., Couto, E. B., & Francisco, P. M. (2015). Board of directors' composition and capital structure. *Research in International Business and Finance*, 35, 1-32. <https://doi.org/10.1016/j.ribaf.2015.03.005>

Arora, P. K., & Mukherjee, J. (2023). External finance dependence, financial development and exports: A firm-level study from India. *International Journal of Emerging Markets*, 20(6), 2364-2385. <https://doi.org/10.1108/IJOEM-07-2022-1156>

Bağır, Y. K., and Seven, Ü. (2022). Access to finance and productivity growth: The role of own and suppliers' financial constraints. *Empirical Economics*, 63(6), 3095-3119. <https://doi.org/10.1007/s00181-022-02238-0>

Bauer, D., Junge, S., & Reif, T. (2024). May the resources be with you: A systematic review and framework of startup funding options. *Management Review Quarterly*, 74(3), 1365-1396. <https://doi.org/10.1007/s11301-023-00336-6>

Bertoni, F., Colombo, M. G., & Quas, A. (2023). The long-term effects of loan guarantees on SME performance. *Journal of Corporate Finance*, 80, 102408. <https://doi.org/10.1016/j.jcorpfin.2023.102408>

Bertoni, F., Martí, J., Reverte, C., (2019). The impact of government-supported participative loans on the growth of entrepreneurial ventures. *Research Policy* 48, 371-384. <https://doi.org/10.1016/j.respol.2018.09.006>

Bravo Ortega, C., Egaña del Sol, P., and Winkler Sotomayor, N. (2023). Does the lack of resources matter in a dual economy: Decoding MSMEs productivity and growth. *Economic Analysis and Policy*, 80, 716-739. <https://doi.org/10.1016/j.eap.2023.08.022>

Bui, A. T., Pham, T. P., Pham, L. C., and Ta, T. K. V. (2021). Legal and financial constraints and firm growth: Small and medium enterprises (SMEs) versus large enterprises. *Heliyon*, 7(12). <https://doi.org/10.1016/j.heliyon.2021.e08576>

Busom, I., Corchuelo, B., and Martinez – Ros, E. (2017). Participation inertia in R&D tax incentive and subsidy programs. *SMALL BUSINESS ECONOMICS*, 48(1), 153-177. <https://doi.org/10.1007/s11187-016-9770-5>

Busom, I., and Vélez – Ospina, J.A. (2021). Subsidizing innovation over the business cycle. *Industry and Innovation*, 28(6), 773-803. <https://doi.org/10.1080/13662716.2020.1801388>
Camisón, C., Clemente, J. A., & Camisón-Haba, S. (2022). Asset tangibility, information asymmetries and intangibles as determinants of family firms leverage. *Review of Managerial Science*, 16(7), 2047-2082. <https://doi.org/10.1007/s11846-022-00522-y>

Capizzi, V., Croce, A., and Tenca, F. (2021). Do Business Angels' Investments Make It Easier to Raise Follow-on Venture Capital Funding? An Analysis of the Relevance of Business Angels' Investment Practices. *British Journal of Management*, n/a(n/a). <https://doi.org/10.1111/1467-8551.12526>

Cao, S., & Leung, D. (2020). Credit constraints and productivity of SMEs: Evidence from Canada. *Economic Modelling*, 88, 163-180. <https://doi.org/10.1016/j.econmod.2019.09.018>

Cowling, M., Brown, R., Liu, W., & Rocha, A. (2024). Getting left behind? The localised consequences of exclusion from the credit market for UK SMEs. *Cambridge Journal of Regions, Economy and Society*, 17(1), 181-200. <https://doi.org/10.1093/cjres/rsad033>

Croce, A., Guerini, M., Ughetto, E., (2018). Angel Funding and the Performance of High Tech Start-Ups. *Journal of Small Business Management* 56, 208-228. <https://doi.org/10.1111/jsbm.12250>

D'Amato, A. (2020). Capital structure, debt maturity, and financial crisis: Empirical evidence from SMEs. *Small Business Economics*, 55(4), 919-941. <https://doi.org/10.1007/s11187-019-00165-6>

Demirgüç-Kunt, A., Martinez Peria, M. S., & Tressel, T. (2020). The global financial crisis and the capital structure of firms: Was the impact more severe among SMEs and non-listed firms? *Journal of Corporate Finance*, 60, 101514. <https://doi.org/10.1016/j.jcorpfin.2019.101514>

Dumitru, I., & Dumitru, I. (2024). Are Firms from European Union Financially-Stressed Countries More Credit Constrained? *Proceedings of the International Conference on Business Excellence*, 18(1), 120-129. <https://doi.org/10.2478/picbe-2024-0010>

Durango Gutiérrez, M.P., Lara Rubio, J., Navarro Galera, A., (2021). Analysis of default risk in microfinance institutions under the Basel III framework. *International Journal of Finance and Economics* n/a. <https://doi.org/10.1002/ijfe.2475>.

Fan, Q., Wang, L., and Jia, W. (2023). Does financial support improve the economic effect of agricultural enterprises? *Applied Economics*, 0(0), 1-14. <https://doi.org/10.1080/00036846.2023.2277699>

Fazzari, S. M., Hubbard, R. G., Petersen, B. C., Blinder, A. S., and Poterba, J. M. (1988). Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity*, 1988(1), 141-206. <https://doi.org/10.2307/2534426>

Fernandez, V., (2017). The finance of innovation in Latin America. *International Journal of Finance and Economics*. <https://doi.org/10.1016/j.irfa.2017.08.008>

Giner, J., Santa-María, M., and Fuster, A. (2017). High-growth firms: Does location matter? *International Entrepreneurship and Management Journal*, 13(1), 75-96. <https://doi.org/10.1007/s11365-016-0392-9>

Fiamohe, R., Dedehouanou, S. F. A., & Araar, A. (2024). What microfinance schemes for women-owned microenterprises' productivity in rural Benin? *Small Business Economics*, 62(3), 1075-1097. <https://doi.org/10.1007/s11187-023-00796-w>

García, C. J., & Herrero, B. (2021). Female directors, capital structure, and financial distress. *Journal of Business Research*, 136, 592-601. <https://doi.org/10.1016/j.jbusres.2021.07.061>

Gopalakrishnan, B., Jacob, J., & Mohapatra, S. (2022). COVID-19 pandemic and debt financing by firms: Unravelling the channels. *Economic Modelling*, 114, 105929. <https://doi.org/10.1016/j.econmod.2022.105929>

Guo, Z., Peng, Y., and Chen, Y. (2022). How Digital Finance Affects the Continuous Technological Innovation of Chinese Energy Firms? *Frontiers in Energy Research*, 10. <https://www.frontiersin.org/articles/10.3389/fenrg.2022.833436>

Haschka, R. E., Herwartz, H., Struthmann, P., Tran, V. T., and Walle, Y. M. (2022). The joint effects of financial development and the business environment on firm growth: Evidence from Vietnam. *Journal of Comparative Economics*, 50(2), 486-506. <https://doi.org/10.1016/j.jce.2021.11.002>

Herianingrum, S., Ratnasari, R.T., Widiastuti, T., Mawardi, I., Amalia, R.C., Fadhlillah, H., (2019). The impact of Islamic bank funding on business. *Journal of Entrepreneurship and Sustainability Issues*. 7, 133-145. [https://doi.org/10.9770/jesi.2019.7.1\(11\)](https://doi.org/10.9770/jesi.2019.7.1(11))

Hogrebe, F., & Lutz, E. (2024). The sunk cost fallacy in venture capital staging: Decision-making dynamics for follow-on investment rounds. *Journal of Corporate Finance*, 86, 102589. <https://doi.org/10.1016/j.jcorpfin.2024.102589>

Hottenrott, H., Richstein, R., (2020). Start-up subsidies: Does the policy instrument matter? *Research Policy* 49, 103888. <https://doi.org/10.1016/j.respol.2019.103888>

Howell, A., (2019). Ethnic entrepreneurship, initial funding, and business performance in China. *Small Business Economics*. 52, 697-712. <https://doi.org/10.1007/s11187-017-9980-5>

Huang, Y., Bai, F., Shang, M., & Ahmad, M. (2023). On the fast track: The benefits of ESG performance on the commercial credit financing. *Environmental Science and Pollution Research*, 30(35), 83961-83974. <https://doi.org/10.1007/s11356-023-28172-x>

Huergo, E., Moreno, L., (2017). Subsidies or loans? Evaluating the impact of R&D support programs. *Research Policy* 46, 1198 - 1214. <https://doi.org/10.1016/j.respol.2017.05.006>

Hussain, S., Nguyen, V. C., Nguyen, Q. M., Nguyen, H. T., & Nguyen, T. T. (2021). Macroeconomic factors, working capital management, and firm performance — A static and dynamic panel analysis. *Humanities and Social Sciences Communications*, 8(1), 123. <https://doi.org/10.1057/s41599-021-00778-x>

Jansen, K., Michiels, A., Voordeckers, W., & Steijvers, T. (2023). Financing decisions in private family firms: A family firm pecking order. *Small Business Economics*, 61(2), 495-515. <https://doi.org/10.1007/s11187-022-00711-9>

Jensen, M. C., and Meckling, W. H. (1979). Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure. En K. Brunner (Ed.), *Economics Social Institutions: Insights from the Conferences on Analysis and Ideology* (pp. 163-231). Springer Netherlands. https://doi.org/10.1007/978-94-009-9257-3_8

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, 76(2), 323-329. <https://www.jstor.org/stable/1818789>

Jin, Y., Ma, Y.-Y., and Yuan, L.-B. (2024). How does digital finance affect the total factor productivity of listed manufacturing companies? *Structural Change and Economic Dynamics*, 71, 84-94. <https://doi.org/10.1016/j.strueco.2024.06.011>

Kalantonis, P., Kallandranis, C., & Sotiropoulos, M. (2021). Leverage and firm performance: New evidence on the role of economic sentiment using accounting information. *Journal of Capital Markets Studies*, 5(1), 96-107. <https://doi.org/10.1108/JCMS-10-2020-0042>

Kapidani, M., Luci, E., (2019). The Effects on Innovation from Financial Sector Development: Evidence from Developing Countries. *Asian Journal of Business and Accounting*. 11, 84-94. <https://doi.org/10.7441/joc.2019.02.06>

Khémiri, W., and Noubbigh, H. (2020). Size-threshold effect in debt-firm performance nexus in the sub-Saharan region: A Panel Smooth Transition Regression approach. *The Quarterly Review of Economics and Finance*, 76, 335-344. <https://doi.org/10.1016/j.qref.2019.09.009>

Kieschnick, R., & Moussawi, R. (2018). Firm age, corporate governance, and capital structure choices. *Journal of Corporate Finance*, 48, 597-614. <https://doi.org/10.1016/j.jcorpfin.2017.12.011>

Kim, H.S., Cho, K.-S., (2020). Financing Resources of SMEs and Firm Performance: Evidence from Korea. *Asian Journal of Business and Accounting*. 13, 1-26. <https://doi.org/10.22452/ajba.vol13no2.1>.

King, R. G., and Levine, R. (1993). Finance, entrepreneurship and growth. *Journal of Monetary Economics*, 32(3), 513-542. [https://doi.org/10.1016/0304-3932\(93\)90028-E](https://doi.org/10.1016/0304-3932(93)90028-E)

Ključnikov, A., Civelek, M., Durda, L., Fialová, V., & Folvarčná, A. (2023). The role of executive characteristics in their evaluation of financial conditions of European SMEs. *E+M Ekonomie a Management*, 26(2), 69-86. <https://doi.org/10.15240/tul/001/2023-2-005>

Kraus, A., and Litzenberger, R. H. (1973). A State-Preference Model of Optimal Financial Leverage. *The Journal of Finance*, 28(4), 911-922. <https://doi.org/10.2307/2978343>

Legesse, T. S., Tang, J., Wu, Z., & Guo, H. (2021). Debt financing, corporate investment and the productivity of capital invested: Evidence from biggest manufacturing countries. *Cogent Economics & Finance*, 9(1), 1936369. <https://doi.org/10.1080/23322039.2021.1936369>

Li, J., Zhao, Z., Cong, L. M., & Xu, Y. (2024). Impact of social insurance law on total factor productivity: Evidence from Chinese micro and small businesses. *Applied Economics*, 56(57), 7937-7959. <https://doi.org/10.1080/00036846.2023.2289914>

Lin, C., He, L., Yang, G., (2020). Targeted monetary policy and financing constraints of Chinese small businesses. *Small Business Economics*. <https://doi.org/10.1007/s11187-020-00365-5>

Lin, Q., He, Z., Li, B., & Liu, Z. (2025). Firm performance, ownership, and securitization: Evidence from non-financial firms in China. *Review of Quantitative Finance and Accounting*, 64(3), 1199-1219. <https://doi.org/10.1007/s11156-024-01337-6>

Lo Monaco, V., Meoli, M., Vanacker, T., & Vismara, S. (2024). Entrepreneurial Team Size and Fundraising Success: Evidence From Equity Crowdfunding. *IEEE Transactions on Engineering Management*, 71, 11687-11702. <https://doi.org/10.1109/TEM.2024.3424193>

Manaresi, F., & Pierri, N. (2024). The Asymmetric Effect of Credit Supply on Firm-Level Productivity Growth. *Journal of Money, Credit and Banking*, 56(4), 677-704. <https://doi.org/10.1111/jmcb.13092>

Manriquez, J., Astroza, S., & Parada-Contzen, M. (2026). The Effect of Different Sources of Funding on Firm Performance: Evidence From Chile. *Latin American Economic Review*, 37, 4. <https://doi.org/10.60758/laer.v37i.451>

Mardones, C. (2021). Ex-post evaluation of public funding programs on innovation in Chilean firms. *Contaduría y Administración*, 66(3). <https://doi.org/10.22201/fca.24488410e.2021.2683>

Mardones, C., Zapata, A., (2018). Determinants of public funding for innovation in Chilean firms. *Contaduría y Administración*. 64, 89. <https://doi.org/10.22201/fca.24488410e.2018.1602>

Martínez, C. (2018). The effects of micro-entrepreneurship programs on labor market performance: Experimental evidence from Chile. *American Economic Journal: Applied Economics* 2018, 10(2): 101–124 <https://doi.org/10.1257/app.20150245>

Mawejje, J., and Sebudde, R. K. (2019). Constraints or Complaints? Business Climate and Firm Performance Perceptions in Uganda. *The Journal of Development Studies*, 55(12), 2513-2525. <https://doi.org/10.1080/00220388.2018.1502878>

Ministerio de Economía, Fomento y Turismo de Chile, (2014). Las empresas en Chile por tamaño y sector económico desde 2005 a la fecha. *Boletín de revisión y clasificación Estatuto Pyme*. <https://www.economia.gob.cl/wp-content/uploads/2014/06/Bolet%C3%ADn-Empresas-en-Chile-por-Tama%C3%B1o-y-Sector-2005-2012.pdf>

Ministerio de Economía, Fomento y Turismo de Chile, (2017). Antecedentes para la revisión de los criterios de clasificación del Estatuto Pyme. *Boletín de Empresas en Chile por tamaño y sector*. <https://www.economia.gob.cl/wp-content/uploads/2014/04/Boletin-Revision-Clasificacion-Estatuto-Pyme.pdf>

Minola, T., Vismara, S., Hahn, D., (2017). Screening model for the support of governmental venture capital. *The Journal of Technology Transfer*. 42, 59-77. <https://doi.org/10.1007/s10961-015-9461-4>

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, 48(3), 261-297. <https://www.jstor.org/stable/1809766>

Mortágua, M., and Solipa, I. (2022). Reviving financial markets – a critical assessment of the single resolution mechanism. *International Review of Applied Economics*, 36(3), 403-423. <https://doi.org/10.1080/02692171.2022.2093339>

Motta, V. (2020). Lack of access to external finance and SME labor productivity: Does project quality matter? *Small Business Economics*, 54(1), 119-134. <https://doi.org/10.1007/s11187-018-0082-9>

Mutsonziwa, K., & Fanta, A. B. (2021). Small Business Performance: Is It Access to Formal or Informal Credit that Matters? *Journal of African Business*, 22(4), 550-563. <https://doi.org/10.1080/15228916.2020.1826854>

Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)

Navarro, L. (2018). Entrepreneurship policy and firm performance Chile's: CORFO Seed Capital Program. *ESTUDIOS DE ECONOMIA*, 45(2), 301-316. <https://doi.org/10.4067/S0718-52862018000200301>

Neyman, J., & Scott, E. L. (1948). Consistent Estimates Based on Partially Consistent Observations. *Econometrica*, 16(1), 1-32. <https://doi.org/10.2307/1914288>

Nguyen, B. (2020). The relative importance of regional institutions and external finance for small business investment: Evidence from Vietnam. *Journal of Institutional Economics*, 16(6), 911-929. <https://doi.org/10.1017/S174413742000017X>

Nguyen, B. (2022). Small business investment: The importance of financing strategies and social networks. *International Journal of Finance and Economics*, 27(3), 2849-2872. <https://doi.org/10.1002/ijfe.2302>

Nguyen, B., & Canh, N. P. (2021). Formal and informal financing decisions of small businesses. *Small Business Economics*, 57(3), 1545-1567. <https://doi.org/10.1007/s11187-020-00361-9>

Ngo, M. N., and Nguyen, T. N. (2022). Financial development and business growth: A case of the Southern Key Economic Region. *Cogent Economics and Finance*, 10(1), 2099501. <https://doi.org/10.1080/23322039.2022.2099501>

Nlemvo, F., and Bouslama, G. (2025). Credit constraints and the high-growth potential of SMEs: A cross-country analysis. *Journal of Small Business Management*, 0(0), 1-39. <https://doi.org/10.1080/00472778.2025.2543268>

Oh, I., and Hwang, S. (2024). Assessing the Effect of the Size of R&D Subsidies on the Economic Performance of SMEs: Comparison of Manufacturing and Service Firms in Korea. *Journal of the Knowledge Economy*, 15(1), 518-546. <https://doi.org/10.1007/s13132-022-01089-5>

Parada, M., Catalán, P., (2020). Effects of public subsidies on firm performance for small and medium-sized enterprises: evidence from the Chilean Economic Development Agency in Chile. (working paper).

- Pham, V. T., & Phan, H. T. T. (2024). Access to credit and labour productivity: A new insight from Vietnamese firms. *Cogent Business & Management*, 11(1), 2291854. <https://doi.org/10.1080/23311975.2023.2291854>
- Pietrovito, F., & Pozzolo, A. F. (2021). Credit constraints and exports of SMEs in emerging and developing countries. *Small Business Economics*, 56(1), 311-332. <https://doi.org/10.1007/s11187-019-00225-x>
- Ross, S. A. (1977). The Determination of Financial Structure: The Incentive-Signalling Approach. *The Bell Journal of Economics*, 8(1), 23-40. <https://doi.org/10.2307/3003485>
- Santi, C., Santoleri, P., (2017). Exploring the link between innovation and growth in Chilean firms. *Small Business Economics*. 49, 445-467. <https://doi.org/10.1007/s11187-016-9836-4>
- Sauer, R. M., and Wiesemeyer, K. H. (2018). Entrepreneurship and gender: Differential access to finance and divergent business value. *OXFORD REVIEW OF ECONOMIC POLICY*, 34(4), 584-596. <https://doi.org/10.1093/oxrep/gry017>
- Schmidt, R. (2023). Are Business Ethics Effective? A Market Failures Approach to Impact Investing. *Journal of Business Ethics*, 184(2), 505-524. <https://doi.org/10.1007/s10551-022-05133-x>
- Serrasqueiro, Z., Pinto, B., and Sardo, F. (2023). SMEs growth and profitability, productivity and debt relationships. *Journal of Economics, Finance and Administrative Science*, 28(56), 404-419. <https://doi.org/10.1108/JEFAS-01-2022-0018>
- Souza, J. C. M. de, Ávlia, E. S. de, and Prado, J. W. do. (2024). Decisões de Estrutura de Capital das Empresas Brasileiras de Capital Aberto a Partir das Teorias de Pecking Order e Trade-off e a Influência da COVID-19. *Revista Evidenciação Contábil and Finanças*, 12(1), 24-37. <https://doi.org/10.22478/ufpb.2318-1001.2024v12n1.67719>
- Stiglitz, J. E., and Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. *The American Economic Review*, 71(3), 393-410.
- Sun, H., Yang, X., Tang, X., and Peng, F. (2023). How innovation funding leads enterprises to engage in research and development: Small and medium enterprises' perspective. *PLoS ONE*, 18(7), e0289166. <https://doi.org/10.1371/journal.pone.0289166>
- Tingbani, I., Afrifa, G. A., Tauringana, V., and Ntim, C. (2024). Trade credit and corporate growth. *International Journal of Finance and Economics*, 29(1), 206-228. <https://doi.org/10.1002/ijfe.2683>
- Voutsinas, K., and Werner, R. A. (2025). Trade-off theory vs. the pecking order hypothesis: Japanese evidence on capital structure under financial constraints. *Structural Change and Economic Dynamics*, 74, 944-962. <https://doi.org/10.1016/j.strueco.2025.06.004>

United Nations Economic Commission for Latin America and the Caribbean. (2024). The impact of public funding for research and development on business performance in Mexico Delia Margarita Vergara Reyes, Alex J. Guerrero, Guillermo Arenas Díaz and Joost Heijs. *CEPAL Review*, 2024(142), 161-179. <https://doi.org/10.18356/16840348-2024-142-8>

Wang, H., and Xu, S. (2022). Heterogeneity Effect of Corporate Financialization on Total Factor Productivity. *SUSTAINABILITY*, 14(11), 6577. <https://doi.org/10.3390/su14116577>

Wang, H., Xiang, X., & Han, L. (2023). Financial development, legal systems and SME finance: Cross-country evidence. *International Review of Economics & Finance*, 88, 981-1002. <https://doi.org/10.1016/j.iref.2023.07.021>

Wang, R., Mohammed, B. S., & Parthasarathy, R. (2023). Analysis on Risk Awareness Model and Economic Growth of Finance Industry. *Journal of Internet Technology*, 24(3), 697-707. <https://jit.ndhu.edu.tw/article/view/2908>

Wellalage, N. H., Kumar, V., Hunjra, A. I., & Al-Faryan, M. A. S. (2022). Environmental performance and firm financing during COVID-19 outbreaks: Evidence from SMEs. *Finance Research Letters*, 47, 102568. <https://doi.org/10.1016/j.frl.2021.102568>

Wu, H., Chen, Z., Chen, H., and Jiang, J. (2022). Modeling the Impacts of Government Subsidies on Total Factor Productivity: An Empirical Study. *Discrete Dynamics in Nature and Society*, 2022(1), 4817109. <https://doi.org/10.1155/2022/4817109>

Yu, J., Peng, F., Shi, X., & Yang, L. (2022). Impact of credit guarantee on firm performance: Evidence from China's SMEs. *Economic Analysis and Policy*, 75, 624-636. <https://doi.org/10.1016/j.eap.2022.06.017>

Yuan, Y., Rong, Z., Xu, N., Lu, Y., (2021). Credit cards and small business dynamics: Evidence from China. *Pacific Basin Finance Journal*. 67, 101570. <https://doi.org/10.1016/j.pacfin.2021.101570>

Zada, M., Yukun, C., Zada, S., (2021). Effect of financial management practices on the development of small to medium size forest enterprises: insight from Pakistan. *Geo Journal* 86, 1073-1088. <https://doi.org/10.1007/s10708-019-10111-4>