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Bachelor Thesis

Factoring and SME financing in Latvia: Firm-level evidence on profitability

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Table of Contents

Abstract

This paper aims to analyze whether the adoption of factoring, a supply chain financing instrument for working capital, is associated with increased profitability for Latvian small and medium-sized enterprises (SMEs). We performed a large-scale corporate survey of SME representatives to learn about their factoring habits. We then conducted semi-structured interviews with industry experts and financiers to match their concerns to those of the SMEs and examine the potential of widespread factoring adoption in Latvia. We discovered that the Latvian factoring market totals roughly 400 firms, which is much smaller than its Baltic neighbors. The underperformance of this market can be traced back to the consequences of the 2008 crisis. We find that some of the key aspects hindering the adoption of factoring are the speed and ease of acquiring factoring, high-interest rates, financial literacy of SMEs, and bureaucracy associated with factoring.

To quantify the profitability prospects, a treatment and control group difference-in-difference regression analysis was performed, measuring whether the decision to adopt factoring is associated with increased return on assets (ROA) in Latvian SMEs. Contrary to previous literature, we find that SMEs using factoring experience a 2.48pp lower ROA over their non-factoring peers during a 3-year window of factoring introduction. However, we also find that factoring is positively linked with asset and revenue growth. We point towards ROA being an inefficient measure of factoring as SMEs using this instrument pursue a growth strategy rather than a profitability one.

Introduction

SMEs are at the core of the European (and Latvian) economies, comprising nearly 99% of the total economically active agents in the EU, yet they still receive insufficient funding (European Commission, n.d.). While the SME funding gap between overly stringent risk capital, illiquid capital markets, and overly prudent bank lending is not a new issue, it is one that has yet to be effectively addressed on a member-state level as outlined by the European Court of Auditors (2022) and European Commission (2019).

Given the recent disruptions in global value chains due to geopolitical, inflationary, and market instability risks, the financing of supply chains becomes even more crucial as small businesses struggle to upkeep with delayed receivables, bad debtors, and stricter bank lending. Historically, unfavorable developments in the lending sector have urged SMEs to source external financing from alternative products. A trend of wider supply chain financing adoption via instruments such as factoring, trade credit, and working capital financing among SMEs has motivated this research. However, the adoption of such instruments follows a peculiar trend in the Baltic states, which show significant divergences. The total factoring volumes for firms in Latvia in 2021 were 4 to 5 times lower than those of its Baltic peers and have been historically stagnant while Lithuania and Estonia have experienced strong growth (FCI, n.d.).

Supply chain financing is a rather new and underutilized mechanism that has only recently been picked up by companies. One of the widely used supply chain financing instruments is factoring. According to R.T. Slee (2021), factoring refers to the practice of selling outstanding customer invoices for less than their face value. It's a financial service that transforms assets into liquid cash, but it's not a form of borrowing. Simply put, factoring is a way of working capital financing where a firm sells its accounts receivables (debtor invoices) usually to a bank or non-bank financial institution. The firm receives cash owed by its customers immediately from the third party and in return pays interest on that money received to the institution that factorized its debtors. Lastly, payments done by the customers are then directed to the financial institution that issued factoring. The counterparty risk is passed to the bank or non-bank financial institution (R.T. Slee, 2021).

As it stands, no known academic papers have researched and quantified the effects of factoring adoption on SME operating performance in the Baltics. Previous papers have focused on working capital management as a whole and what profitability can be derived from shortening the

cash flow cycle. A paper by Shou et al. (2021) explores the materiality of factoring adoption on manufacturing firm operating performance in China. The paper finds that more than half of the sample firms show statistically significant positive abnormal returns, therefore, the paper claims that supply chain financing instruments are directly linked with improvements in firm's profitability. An earlier study by Ali et al. (2018) examined the same relationship by taking a qualitative approach to a sample of SME firms in Pakistan's textile industry. Although the paper did not establish a direct materiality effect, the authors conclude that supply chain financing strongly impacts company-level operational performance metrics. Given that existing research narrows down on specific economies, this distorts the generalizability of their results which in return, once again, helps to highlight the importance of targeted research on the Baltic states. Especially given the long-lasting underfinancing of SMEs.

Therefore, research on the empirical effects of profitability of SMEs in Latvia that have adopted factoring is crucial. Our research aims to explore what are the effects on Latvian SME profitability measured by return on assets (ROA) that can be attributed to the adoption of factoring. This research focuses on the promising advancements in supply chain financing (and factoring) which have risen in volumes globally and could prove to be significant for productivity developments among Latvian SMEs (WorldBank Blogs, 2021, FCI, n.d.).

We put forward the following research question (*RQ 1.)*: What is the impact of factoring introduction as a working capital management instrument on Latvian SME profitability?

Literature review

Small and medium-sized enterprise access to financing and constraints in Europe

In 2020, SMEs in Europe made up for 96.2% of all enterprises (or 22.5 million registered SMEs), generated 52.5% value added of all private and non-financial firms (or €3.4 trillion SME gross income), and employed 64.3% of the working population in Europe (or 82.0 million SME employees) (Eurostat, nd.). Serving as the foundation of the EU economy, SMEs still perform under "insufficient access to finance" (European Commission, 2022). Limited financial capacity is demonstrated by customer payment delays, suppressed liquidity, and scarce loan availability (European Commission, 2022). Ever since the Global Financial Crisis of 2007 - 2008, SMEs have been increasingly exposed to financing bottlenecks as they show greater dependence on bank lending (McGuinness et al., 2018, Behr et al., 2017, Ryan et al., 2014, Beck et al., 2008). The last financial crisis has been regarded as the beginning of a downfall of the credit supply to SMEs (Popov & Udell, 2012, Jimenéz et al., 2012, Deyoung et al., 2015). In fact, the volume of loans for SMEs (with a value of less than €1 million) decreased sharply during the time from 2008 to 2011, by 47% on average across the EU with some member states exhibiting a downfall of 66% and 82% (McGuinness et al., 2018).

More recent academic studies suggest that the credit markets have yet to fully recover in developed economies and SMEs are still discriminated across the EU - Mulier et al., 2016, found that European SMEs are on average charged with higher interest rates on their financial debt, Wang et al., 2020, pointed out that in 2014 SMEs in the Eurozone faced an average borrowing cost of 140 basis points higher than large enterprises, moreover, this disparity increased to 210 basis points for micro firms, and, finally, Behr et al., 2017, points to the persevering "cyclicality of the European banking sector", which could prove detrimental due to inefficient resource allocation (excess supply of credit in boom cycles and insufficient SME funding during bust cycles). One compelling argument from a study of 17 EU economies by Wang et al., 2020, points out that higher incurred banking costs are at fault for discouraging banks to lend to SMEs without discretion (extensive monitoring/administrating of the debt, information opaqueness, higher risk assumed, etc.). As a result, Casey & O'Toole, 2014, find that these credit-rationed SMEs are increasingly looking for finance elsewhere, estimating that the likelihood of adopting alternative financing solutions increases by 9% for credit-constrained firms. The switching dynamics were first

published by Carbo-Valvedere et al., 2016, who found that SME access to finance shifted during the 08 crisis in favor of trade credit. They find that alternative lenders such as trade creditors serve as the last resort to finance the capital expenditures of SMEs during global downturns. This view is also supported by Chavis et al. (2010) who observed that younger firms demonstrate a greater propensity to adopt alternative financing mechanisms to meet their short-term working capital and long-term investment needs, as compared to relying on conventional bank finance.

But perhaps the most recent evidence comes from the European Central Bank's (ECB) Access to Finance of Enterprises (SAFE) survey in the euro area, which serves as the leading indicator of business consensus towards financing products. The latest issue (ECB, 2021) covers 10,493 enterprises, of which 91% are classified as SMEs. As such, the latest round shows that SMEs indicate deterioration in access to external financing (while larger firms report improvements) and during Covid-19 the overall funding gap widened for SMEs in the EU - advancements in the supply of external financing were overshadowed by consequent increases in demand, showing an overall EU average of 4% net positive gap with some countries exhibiting a gap far above the average like Greece 14%, Portugal 13% and Belgium 8% (ECB, 2021).

SME financing in Latvia – the supply side

The financial crisis had detrimental effects across all EU countries, however, it has been noted that Latvia was amongst the most severely affected (McGuinness et al., 2018). Despite this, the Baltics had a strong recovery with Latvian GDP growth rates exceeding those of the EU for the period 2011-2019 (OECD, 2022). Like the EU, Latvian SMEs comprise 99.8% of all economically active agents, furthermore, 92.1% of those are micro enterprises (OECD, 2022). As a result, the local bank portfolios are dominated by SME loans, which in 2020 represented 73% of the total domestic loans to non-financial corporations (NFCs) (OECD, 2022). A year prior to the onset of the Covid-19 crisis, SME lending activity in Latvia was 7% higher in terms of the outstanding loan amount.

Most recent studies by the IMF, 2022, show that prior to the Covid-19 pandemic, Latvia's corporate equity gap was estimated at 5 percent of GDP based on firm-level data and is projected to be 9 percent of GDP post-pandemic. The corporate equity gap is an estimate of the theoretical difference between capital invested under well-informed and competitive markets and the actual capital invested (Wilson et al., 2018). These difference levels in Latvia were among the highest of

the 15 euro-area sample countries. This gives us a first indication that financing markets are underperforming, and Latvian companies should look for financing elsewhere. Exacerbating this fact are the loan interest rate summary statistics from the same study on Latvia, which show that in the period 2015-2022, small non-financial corporation (NFC) loan interest averaged at 4.07% whereas the same loan for medium and large enterprises stood at 2.47% and 3.47% respectively (IMF, 2022) - the highest levels in the Baltics. When generalizing the Baltic region, the local interest rates are around 4pp higher than euro-area averages.

As such, bank profitability in the Baltic countries is among the highest in the euro area, therefore suggesting that higher interest rates also get reflected in higher profits. Benkovskis et al. (2021) and Bank of Latvia (2021) have provided key characteristics of the Latvian banking sector, which is deemed as a low-competition environment, conservative lending practice, lower risk appetite, and higher bank costs. These are all factors driving interest rates and facilitating a habitat not optimal for SME development. Different international studies have shown crucial links between the banking sector development and SME financing. The classic "market power view" by Carbó-Valverde et al., 2009, states that "less competitive banking markets are associated with less credit availability and a higher price for credit", and Ryan et al. 2014, find that a higher degree of market power held by banks is correlated with decreased levels of investment by small and medium-sized enterprises (SMEs).

Working capital management practices in Latvia – the demand side

In 2020, the banking sector's total new lending to non-financial corporations in Latvia grew by 5.8%, however, SME loan activity suffered a decline of 3.2% in the same period (OECD, 2022). Taking a glance at more recent developments in Altum's unaudited interim summary accounts of 2022, it is noted that the demand for specialized financing products for SMEs has dwindled in 2022 compared to the uncertainty and pandemic-driven 2021, 7.6% growth in 2022 and 11.5% in 2021. As the demand for working capital products fell slightly, the underlying issues persist. According to the Euro area bank lending survey of June 2022: main results for Latvia, demand for short-term loans grew as of an increased need for working capital and inventory. This demand stemmed from surging commodity prices and SMEs making stock provisions for longer periods. On the contrary, Latvian banks tightened their credit standards for corporate and even household loans in the past quarters. Inventories and working capital were a top SME priority

(100% of the surveyed region banks mentioned this as a contributor to loan demand), whereas 75% of the banks reported this as a contributing factor for large firms. Building on the need for working capital, another survey from SEB bank on corporates expressed that 15-20% of SMEs surveyed in the Baltics pointed to problems with late invoice payments or non-payments. As SEB notes, this outlines a negative tendency of worsening liquidity as materials costs increase and some customers intentionally delay payments to suppliers to preserve liquidity.

Working capital management practices in Lithuania and Estonia

According to the SAFE survey 2021, Lithuania and Estonia are one of the leading European countries in terms of demand for working capital financing; 34% of surveyed SMEs in Lithuania applied for financing (ranking 3rd in the EU), and 30% of surveyed SMEs in Estonia (ranking 8th in the EU), which is well above the EU average of 24%. On the other hand, the Baltic states rank the worst in the whole EU in terms of obstacles when acquiring financing. Only 25% of surveyed SMEs in Lithuania and 22% in Estonia mention no obstacles when accessing financing which is far below the EU average of 47%. Latvia ranks the worst among all EU countries; only 16% of SMEs in Latvia face no issues with their financing needs. The leading obstacles being insufficient collateral, paperwork abundance, and high-interest rates.

The general business environment is more favorable in Estonia and Lithuania. The economies are more globalized – real exports were 73 and 78% of GDP in 2019, respectively, while Latvia had 60%. It is also thought that Latvia sits lower in the supply chains than its Baltic peers – Latvia's exports contain the lowest share of imports, suggesting there is limited domestic value-added to reexported products (EBRD, 2022). As regards innovation for future development, Estonia spends the most on R&D (0.6% of GDP), while Latvia and Lithuania both do 0.3%. Additionally, according to the European Innovation Scoreboard (EIS) 2019, Estonia ranked 11th, Lithuania ranked 19th, and Latvia ranked 23rd. Small businesses in Estonia and Lithuania demonstrate higher innovation levels compared to an average EU SME, while Latvian firms were lagging (EBRD, 2022).

The SME financing market in Lithuania and Estonia is also more developed than Latvia's. This follows the general tendency of public equity, corporate bond, and private equity markets all being better capitalized in Lithuania and Estonia, with Estonia being the leader in all segments measured as % of GDP (EBRD, 2022). This directly translates into factoring volumes

as they correlate with the total investment and GDP activity of the economy (The Baltic Times, 2022). As such, Estonia is the largest factoring hub with a total factoring volume of 3900 mEUR, followed by Lithuania at 3300 mEUR, and Latvia at 823 mEUR (FCI, nd.).

The factoring turnover is made up of 3 large banks and 12 smaller providers in Latvia, while the Estonian market has 4 large and 20 smaller players, and Lithuania – 6 large and 10 smaller providers (The Baltic Times, 2022). Latvia's factoring market is constrained by less large and institutional players, thus creating a less competitive environment for product development. As such, the smaller offer, lack of innovation, unfavorable market developments, and less export activity via credit sales are the main differentiators of the Baltic economies.

SME factoring – international experience

Owing back to the SAFE survey 2021, some 36% of European SMEs hinted at using financing for inventories and working capital. Factoring is more suitable for SMEs as less information on credit scoring is required to predict future loan performance, rather the quality of accounts receivables in a factoring deal are evaluated (Berger & Udell, 2006). More so, the use of factoring can alleviate further regulatory burdens. Take an example of an Estonian firm whose receivables come from a client in Germany. The Estonian firm, while seemingly in a weaker "domestic information market" can still be appropriately assessed for its creditworthiness due to the strength of its German counterparty (Berger & Udell, 2006). Klapper, 2006, also agrees that factoring helps to provide financing to firms that pose a high risk due to their lack of transparency. It is this ability to transfer credit risk from the borrower to a third-party client that gives rise to potential widespread factoring adoption for countries with a lack of strong enforcement of contracts, ineffective bankruptcy procedures, and incomplete documentation of claims (Klapper, 2006).

Research exploring the effect of factoring usage on firm operational performance has been scarce. A paper by Shou et al. (2021) empirically examines this relationship of reverse factoring on a curated dataset of manufacturing businesses in China. They find that 56.9% of the sample companies show statistically significant positive sales growth and claim that reverse factoring has a favorable impact on firms' operational performance by increasing profitability and cost efficiency. An earlier study by Ali et al. (2018) also explores the relationship between supply chain financing (SCF) and SME performance, yet they approach it from a qualitative research

methodology by observing 380 questionnaires from textile sector SMEs in Pakistan. While no precise materiality is established, the same relationship is confirmed where SCF shows a strong effect on company performance. The authors also emphasize that there is a sizable, unexplored research gap concerning this subject.

Another interesting aspect explored by Pan et al. (2020) concerns firm cash holdings and whether they improve upon the adoption of factoring or supply chain financing. Using regression analysis, they find that SCF does indeed improve cash holdings, speed up cash turnover, and enhance firm competitiveness. This would also indicate that factoring offers significant working capital improvements and operational liquidity for SMEs. Many more papers, the likes of Nguema et al (2021) and Bi et al (2021) also observe that factoring leads to increased firm operational performance.

In addition, there have been many works concerning other working capital management instruments and their link to operational performance. Gofman & Wu (2022) find that there is a direct correlation between profitability and trade credit ratios. Moreover, similar published works by Pais & Gama (2015), Lyngstadaas & Berg (2016), Hoang & Xiao (2019), and García-Teruel, Martínez-Solano (2007) find that working capital management in terms of cash conversion cycle shortening via external financing results in value creation. They also mention that this is particularly important for SMEs given that most of these firms have short-term assets and, accordingly, short-term liabilities to match these cash flows.

Finally, a study done by Pérez-Elizundia, Delgado-Guzmán, and Lampón (2020) takes a qualitative approach to research factoring adoption in Mexico. The authors find that the primary obstacles in factoring adoption are limited financial knowledge and understanding of factoring, unfavorable legal environments, a lot of administrative work for the lender in the issuance process of factoring, or the complicated Know Your Customer (KYC) processes.

A study on Turkish firms by Bilgin & Dinc (2019), reveals that factoring is more popular among newly established firms that have high growth potential and high capital costs. This suggests that these firms may use factoring in conjunction with other financing options. Additionally, authors find that factoring has a positive relationship with a firm's leverage, but profitability defined as EBIT over total assets has a negative relationship with a firm's leverage.

Throughout the course of our research, we are highly influenced by the works of Pais & Gama (2015), Lyngstadaas & Berg (2016), and Garcia-Teruel & Martinez-Solano (2007) and

Deloof (2003), who all test similar concepts on different geographies. They lay out the foundations of working capital management and profitability. They find that Portuguese, Spanish, Norwegian, and Belgian firms all show inverse relationships between days of inventories, days of payables, and days of receivables (all key variables of the working capital) with return on assets. Implying that maintaining a low level of both inventory days and accounts receivable days leads to better performance outcomes. The outperformance is prompted by the higher turnover of inventory, reduced cash gaps, and maintaining of optimal working capital levels. The selected studies represent the most relevant published fieldwork on the narrowly researched topic of working capital management and firm-level profitability in key European SME markets.

We draw parallels to these findings with those of Klapper, 2006, who claims that SMEs use factoring for working capital financing when their client base and invoices build up, thus converting these illiquid assets into immediate cash and shortening cash conversion cycles. By combining the empirical works on working capital management and theoretical foundations of factoring benefits, we develop our research. No similar works on merging both dimensions exist.

RQ 1. What is the impact of factoring introduction as a working capital management instrument on Latvian SME profitability?

Hypothesis. Latvian SME firms which utilize factoring will show an improvement in profitability metrics compared to those that do not use any supply chain financing instruments.

Methodology

Data sample

The data used in this study is obtained from the Orbis Bureau van Dijk database and targeted firm-level questionnaires. In the Orbis database, we sort for a sample of Latvian small-and-medium enterprises (SMEs) as well as micro-enterprises. The SME guidelines are set out by the European Commission regulation 800/2008:

- Revenue no less than 2 mEUR and no more than 50 mEUR;
- Total assets no less than 10 mEUR and no more than 43 mEUR;
- Employees no less than 10 and no more than 249.

The micro-enterprises are sorted in accordance with the Central Finance and Contracting Agency in Latvia:

- Revenue less than 2 mEUR;

- Total assets less than 2 mEUR;

- Employees less than 10.

While no formal minimal revenue or balance sheet requirement is defined for micro-enterprises, we choose to only include firms with a minimum of 100 kEUR in assets and revenues to avoid empty results or "ghost companies" in Orbis. The Latvian SME and micro-firm data sample is also sorted to exclude financial, insurance, and real-estate firms (by NACE classification) due to their asset-intensive balance sheets which might distort profitability ratios and have a different structure of financial statements. A similar sample sorting technique is seen in Pais & Gama (2015), García-Teruel & Martínez-Solano, (2007), and Lyngstadaas & Berg (2016), who all research SMEs on their working capital practices.

The obtained Orbis data sample covers 4,062 Latvian SMEs and 30,809 micro firms, from which a total of 19,391 show valid email addresses for survey distribution purposes.

Firm-level questionnaire distribution

With the filtered Latvian SME and micro-enterprise sample, we look for the e-mail addresses of representatives through the built-in features of the Orbis Bureau van Dijk database. After gathering the necessary contact information, the identified representatives are distributed a sample questionnaire (as seen in Asselbergh & Greet's (2002) distribution of questionnaires to credit managers) to inquire whether the firm has ever used factoring. If the firm has had any factoring relationships, then it is required to state the year in which it first started adopting them, how large its factoring credit line was (which is an optional question), and, finally, its plans on using factoring in the future. We also include a question regarding the firm's registered name so we can match the questionnaire data to the respective firm's financial statements afterwards.

The published version of the survey includes 5 questions and can be seen in the appendices from 1 to 5. The questionnaire example in text format is listed below:

1. Has your company ever used factoring services (factoring line of credit to fund invoices)?
   - Yes
   - No

2. What year did your company first start using factoring services? (Displayed if the company responded "Yes" to the first question)
   - Option to enter a precise year
3. Approximately, how large is your company's factoring line of credit?
   - Up to 100 kEUR
   - 100 - 200 kEUR
   - 200 - 300 kEUR
   - 300 - 400 kEUR
   - 400 - 500 kEUR
   - More than 500 kEUR
   - Other
   - I do not want to disclose
4. The registered name of your represented company.
5. Does your company have plans to use factoring services in the future? (Displayed if the company responded "No" to the first question)
   - Yes, we need factoring
   - No precise plans
   - No, we do not need factoring

Control and treatment group definition

Firms that respond "Yes" to the first question will be deemed as the treatment group (the firms which are using/ or have used factoring). Firms that respond "No" to the first question will be deemed as control firms. We add an extra criterion for the control firms as they also need to indicate on the last question either "Yes, we need factoring" or "No precise plans". This logic ensures some degree of treatment randomization as the firms who want factoring or at least have no decisive plan against it will be more comparable in their business models to the treatment group, as opposed to those who certainly do not need it and perhaps have other sources of financing not relevant to this study. This can also be looked at from the credit rationing perspective, as seen by Casey & O'Toole (2014), who survey firms on their credit constraints. Their paper defines credit-rationed and self-rationed firms. In our study, credit-rationed control firms shall be those who answered that they will need factoring in the future, thus assuming they possess similar demand

for working capital management products as the treatment firms. Casey & O'Toole (2014) also included firms that answered they have no concise plans for future financing due to the limited sample size in their survey – we employ a similar approach. Self-rationed firms are those which willingly exclude themselves from financing products (they will not need factoring in the future) due to unforeseen reasons and they are not considered in our study).

Sample collection

From Jan 11, 2023, to Feb 3, 2023, a total of 9671 surveys were distributed via email to corporate addresses sourced from Orbis. From the 9671 emails sent, approximately 25% bounced back due to invalid or outdated addresses, however, a total of 407 responses did manage to channel through the survey as recorded by Qualtrics, a survey management platform. Of those 407 session recordings, 117 respondents did not manage to fully complete the survey and a further 30 of those who did complete the survey did not provide an identifiable company name in the last question, thus ruling them out from further analysis. Therefore, we arrive at a working sample of 246 SME and micro firms from whom we can obtain financial data. Of those 246 firms, exactly 86 have identified themselves as clients of factoring (treatment group) and indicated the year they first started using this service.

With the preliminary sample in place, we start further cleaning. Firms that started using factoring before 2011 (18 firms) are removed from the treatment group due to data availability issues (Orbis does not display financial metrics earlier than 2011). In addition, we removed another 15 firms from the treatment sample due to confounding answers (survey done multiple times with conflicting answers), not being classifiable as SMEs, and poor financial reporting. We are left with a treatment group of 53 observable firms. As for the control group we are left with 73 control firms following the same sample cleaning logic.

We extract the following data for the total 126 firm sample - NACE Rev. 2 main section, NACE Rev. 2 core code - description, NACE Rev. 2 core code (4 digits), Revenue, ROA, Debt-to-assets, Number of employees, Total assets, Inventory, Equity, Fixed assets, Gross profit, and Cash and cash equivalents. All variables are extracted for the period 2011 - 2021.

Matching principle

For the control and treatment group matching we use Asselbergh & Greet's (2002) methodology, which creates a control group by pairing firms on their industry classification codes. We also draw inspiration from Pais & Gama (2015), García-Teruel & Martínez-Solano, (2007), and Lyngstadaas & Berg (2016), who split their sample SMEs by ROA quartiles when performing a univariate analysis. Propensity score matching is not used due to the constrained sample size in our research.

We begin by sorting our sample by broader industry classification NACE Rev. 2 main sections. As such, our sample divides in:

	Treatment	Control
C - Manufacturing	21	15
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	20	18
A - Agriculture, forestry, and fishing	9	9
H - Transportation and storage	1	6
F - Construction	1	6
M - Professional, scientific, and technical activities	1	5
B – Mining and quarrying	0	1
E - Water supply; sewerage, waste management and remediation	0	1
I - Accommodation and food service activities	0	1
J - Information and communication	0	2
N - Administrative and support service activities	0	4
P – Education	0	1
Q - Human health and social work activities	0	2
L - Real estate activities	0	1
R - Arts, entertainment, and recreation	0	1
N	*53*	*73*

Table 1. Unmatched sample industry split. Table by authors.

We calculate the median 2011- 2021 values for the total assets, debt-to-assets, and revenues to gauge the approximate size and leverage of our 126 firms. For each industry, we estimate the revenue, debt-to-asset, and total asset quartiles at the 25th, 50th and 75th percentile (including the median values as part of the calculation). We then employ a matching logic following a 1 treatment firm for 1 control firm principle (or the nearest neighbor to 1). The matching logic performs within-industry matches to pair firms within the same revenue, asset, and debt-to-asset quartiles. While firm pairs that fall within the same industry and the same quartiles of all three metrics are considered as very strong, due to the limited sample size, pairs were also made based on matches for only 1/3 of metrics and regarded as weaker. Additionally, 8 cross-industry matches were carried out due to the insufficient number of treatment and control firms for some industries. Cross-industry pairs were pooled and followed the same logic of the three metric quartiles. The matched firm sample with anonymized firm names can be seen in Appendix 6. The control firms take the

T0 at the year their treatment counterparty started using factoring, as can be seen from the univariate analysis in the results section.

As such, we arrive at a sample of 53 treatment and 53 control firms matched. This sample will be used throughout all the results sections. We estimate to have captured around 10% of the total 400 factoring client market in Latvia based on total corporate client size (as confirmed during interviews with the region's largest lender in the SME segment and manager of Latvia's largest factoring portfolio).

Variables

As the dependent variable we choose return on assets (ROA), as seen in Pais & Gama (2015), García-Teruel & Martínez-Solano (2007), and Lyngstadaas & Berg (2016). This variable is defined as the ratio of EBIT (earnings before interest and taxes) to assets. The control variables are listed in Table 2:

Variable	Source	Formula	Rationale	Expected effect on ROA	Literature
ROA	Orbis	Earnings before interest and tax (EBIT) / Total assets	Working capital management practices increase return on assets as cash-conversion cycles shorten and operational efficiency is achieved	-	Lyngstadaas & Berg (2016), Pais & Gama (2015), García-Teruel & Martínez-Solano, (2007).
Revenue growth	Orbis	(Revenue T / Revenue T-1 - 1) * 100%	Sales growth is directly linked with working capital management as larger volumes of sales require investment in working capital	Positive	Lyngstadaas & Berg (2016), Pais & Gama (2015), García-Teruel & Martínez-Solano, (2007).
Debt-to-assets	Orbis	Total debt / Total assets	Provides insight into the firm's financial risk and its ability to meet its obligations. Higher levels of debt relative to assets may indicate a higher financial risk, which could have a negative impact on ROA. The debt-to-assets ratio can also be an indicator of the firm's access to credit and its ability to fund its working capital needs. For example, a firm with a high debt-to-assets ratio may have difficulty obtaining additional financing to support its working capital requirements, which could negatively impact ROA.	Negative	Lyngstadaas & Berg (2016), Pais & Gama (2015), García-Teruel & Martínez-Solano, (2007).
Log assets	Orbis	Logarithm (total assets)	Larger firms may have economies of scale that could affect their profitability differently than smaller firms.	Positive/ negative	García-Teruel & Martínez-Solano, (2007) and Lyngstadaas & Berg (2016) find a positive relationship, whereas Pais & Gama (2015) find negative.

Current assets ratio (CAR)	Orbis	Current assets / Total assets	Investments in fixed assets tend to generate higher returns compared to investments in current assets, which may represent a lost opportunity. However, keeping a certain level of current assets, such as inventory, can serve as a safety buffer and contribute to future sales and profitability.	Positive	Pais & Gama (2015).
Current liabilities ratio (CLR)	Orbis	Current liabilities / Total liabilities	Shows debt composition. Current liabilities are typically associated with a firm's operating activities and sales, including accounts payable. Higher levels of current liabilities may be a result of increased purchases due to higher sales but may also indicate that the firm is not meeting its debt obligations, which could negatively impact profitability.	Positive	Pais and Gama (2015) find a positive relationship between current liabilities and profitability.

Table 2. Regression variable description. Table by authors.

We add to the existing literature by introducing Factoring and Treatment indicator variables. The Factoring dummy takes a value of 1 for all firm years in the treatment group (firms that responded "Yes" to the factoring survey question) and 0 for all control firm years.

Factoring dummy	First time used factoring					
	2012	2013	2014	2015	2016	2017
Treatment	1	1	1	1	1	1
Control	0	0	0	0	0	0

Table 3. Factoring dummy description. Table by authors.

The Treatment Indicator takes value of 1 at the start of factoring adoption and measures the interaction of the treatment introduction and year. For example, a hypothetical scenario of factoring introduction in 2015 will render the value of 1 for the Treatment indicator at that same year.

Treatment indicator	First time used factoring					
	2012	2013	2014	2015	2016	2017
Treatment	0	0	0	1	1	1
Control	0	0	0	0	0	0

Table 4. Treatment indicator description. Table by authors.

Treatment Indicator 1 takes a value of 1 one year after the introduction of factoring. This is done to capture possibly delayed effects of factoring introduction as suggested by expert interviews.

Treatment indicator 1	First time used factoring					
	2012	2013	2014	2015	2016	2017
Treatment	0	0	0	0	1	1
Control	0	0	0	0	0	0

Table 5. Treatment Indicator 1 description. Table by authors.

Treatment Indicator 2 takes value of 1 two years after the introduction of factoring. This is done to capture possibly further delayed effects of factoring introduction as suggested by expert interviews.

Treatment indicator 2	First time used factoring					
	2012	2013	2014	2015	2016	2017
Treatment	0	0	0	0	0	1
Control	0	0	0	0	0	0

Table 6. Treatment indicator 2 description. Table by authors.

Regression analysis

To quantify the Latvian SME profitability differentials from factoring adoption, we use a difference-in-differences (DID) regression with time and industry fixed effects. We also cluster for standard errors at the firm level. A DID specification allows us to observe pre- and post-factoring adoption impacts on the dependent variable for treatment and control groups for a panel dataset. The DID regression offers a robust solution for our research question as it is compatible with smaller sample sizes,

Similar DID regressions have been done by Kwanghee & Kwon (2015), who measure the financial impact of new policy adoption for selected firms, Bindal et al., (2022), who measure regulatory treatment on banks, yet their analysis is more complicated as it deals with the indirect treatment of smaller banks, and Kraemer-Eis (2018), who measures the treatment effect of EU-guaranteed loans on French SMEs.

As such, our regression model is fitted to the chosen control and treatment variables as shown below:

$ROA_{it} = \beta_0 + \beta_1 \, Factoring_{it} + \beta_1 \, Treatment \, indicator_{it} + \beta_2 \, log \, Assets_{it} + \beta_3 \, Revenue \, growth_{it} + \beta_4 \, Debt\text{-}to\text{-}assets_{it} + \beta_4 \, CAR_{it} + \beta_4 \, CLR_{it} + Time \, effects + Industry \, effects + \varepsilon_{it}$

Time fixed effects

Each of the treatment firms began to use factoring services in different time periods. Therefore, the state of the overall Latvian economy, when a firm adopted factoring products, differs for each firm. Thus, we supplement the DID regression with year dummies, which capture time-varying unobserved factors.

Industry fixed effects

When estimating the DID regression, we absorb the categorical variable of NACE industry classification, which can control for any unobserved differences in the dependent variable across the different sectors.

Firm-clustered standard errors

By clustering the standard errors at the company level, the regression accounts for any within-firm correlation or clustering that may affect the statistical significance of the regression coefficients. This improves the accuracy of the estimates and the reliability of the statistical inference.

Qualitative interviews

Supporting the quantitative part, we carried out six semi-structured interviews, consisting of four interviews with industry experts who represent the supply side of factoring, and two interviews with representatives from different SMEs, who represent the demand side of factoring. The semi-structured interview format allowed us to use a predetermined list of open-ended questions, which encouraged a discussion, while also allowing the flexibility to delve deeper into specific themes or responses.

Results

Summary statistics

We begin by observing the summary statistics of our matched sample, which covers 53 treatment and 53 control firms over the years 2011 – 2021. As such, by excluding n.a., zero, and empty values produced by the Orbis database, we arrive at a total of 1006 firm-year observations. Furthermore, to account for outliers without having to remove the extreme values and preserve our sample size, we use winsorizing at the 95th percentile for all variables. We look at all the previously defined regression variables as well as the absolute value of revenues to gauge the median size of our sample firms. We derive the mean, median, percentile, min/max, and standard deviation values as seen in Panel A. Following the previously set out SME size guidelines, our firms fit the criteria with the median revenues for 2011-2021 standing at 3.6 mEUR. The matched SME sample displays a median ROA of 10.6%, and an annual revenue growth of 20.9%, pointing to the

volatility of the SMEs, a CAR ratio of 0.61 and CLR of 0.55. The debt and asset composition ratios are in line with the previous SME literature. According to García-Teruel and Martínez-Solano (2007), most SMEs lack long-term assets such as buildings or vehicles, resulting in a high percentage of current assets in relation to total assets (CAR). This means that most of their assets are made up of inventory, accounts receivable, and cash balances. Similarly, liabilities with maturities of less than one year represent the majority of SME financing due to the struggle to secure funding from long-term capital markets (CLR), as seen in García-Teruel & Martínez-Solano (2007) and Pais & Gama (2015).

It is interesting to note that our sample median leverage (or debt-to-assets ratio) is quite high at 0.84. Lyngstadaas & Berg (2016) note that SMEs often rely on debt financing to support a business model where their assets are closely tied to their sales. Their sample median leverage from Norway stands at 0.65. According to Zelgalve & Romānova (2012), Latvian enterprises have experienced a consistently higher growth of debt capital than equity capital, with debt levels in all sectors remaining higher than in neighboring countries. This is thought to be influenced by factors such as lower foreign direct investment and lacking development of the capital market when compared to the rest of the Baltics. As a result, the share of debt capital in Latvian enterprises increased substantially from 56.3% in 2001 to 74.2% in 2009 and remained elevated.

Panel A. Descriptive statistics for all financial variables, 2011 – 2021 (95th % winsorized values)								
	count	mean	p25	p50	p75	min	max	sd
ROA	1,002	10.62	2.55	7.52	17.25	-9.71	42.00	12.77
CAR	1,003	0.61	0.35	0.63	0.87	0.18	0.99	0.27
CLR	999	0.55	0.38	0.56	0.73	0.14	0.91	0.23
Debt-to-assets	995	0.84	0.60	0.81	1.05	0.25	1.62	0.36
Revenue growth	894	20.94	-3.50	10.13	32.61	-25.29	142.31	40.02
Revenue	1,001	3,646,783	741,429	1,555,312	4,303,691	194,497	16,580,818	4,590,764
N	1,006							

When observing our treatment and control split, we see that it is overrepresented in industries such as manufacturing, wholesale, and agriculture (as seen from Panel B). This reconciles with our expert interview remarks as well as previous literature on working capital management – industries with higher wholesale and B2B exposure find themselves in need of more meticulous management of cash flows due to dependency on credit sales. As such, the top 3 industries account for 87% of our sample firm count. This is also in line with the general notion

that SMEs, both in Europe and Latvia, are unproportionally more present in the non-financial sectors, most commonly, manufacturing, wholesale, and retail trade (European Commission, 2019).

We observe that manufacturing, wholesale, and agriculture businesses achieve similar median profitability in terms of return-on-assets (6.69-7.19%). However, wholesale and manufacturing firms seem to be the most comparable with similar D/A leverage profiles (0.88 and 0.78 respectively), revenue growth prospects (9.54 and 9.64%) as well as debt and asset structures, giving higher weight to short-term (or current) components. Agriculture is more asset-intensive with fixed assets and non-current liabilities dominating the capital structure. All median industry revenues range from 1.03 mEUR to 2.03 mEUR. It should be noted that revenues below 2 mEUR (as set by the EU Commission on SME classification) seemingly violate the SME criteria, however, that is due to the inclusion of micro-enterprises in our sample. According to Beizitere et al., (2022), over 90% of small and medium-sized enterprises in Latvia are classified as micro-enterprises, therefore exclusion of those would omit a significant portion of Latvian enterprises.

Panel B. Descriptive statistics industry split, median values 2011-2021 (95th % winsorized values)

	Total firms	Control firms	Treatment firms	ROA	Debt-to-assets	CAR	CLR	Revenue growth	Revenue
G - Wholesale and retail trade	38	18	20	6.69	0.88	0.87	0.73	9.54	1,335,459
C - Manufacturing	36	15	21	6.91	0.78	0.52	0.55	9.64	2,038,540
A - Agriculture, forestry, and fishing	18	9	9	7.19	0.66	0.28	0.37	13.71	1,030,017
F - Construction	6	5	1	10.56	0.92	0.74	0.55	11.54	1,712,552
H - Transportation and storage	6	5	1	8.04	0.82	0.33	0.44	8.92	1,964,889
M - Professional, scientific, and technical activities	2	1	1	6.10	0.76	0.42	0.55	16.70	1,924,080
N	106	53	53						

Treatment vs control performance statistics

Furthermore, we also look at the preliminary trends for treatment vs. control group performance by their median 2011-2021 values (Panel C). While this does not yet observe the causality effect from factoring adoption, the median values give us a first insight into the profiles of factoring users and non-users. As such, the first results show comparable profitability figures between the treatment and control firms (7.62 and 7.43% ROA respectively). We also note that the treatment firms generate more revenues (2.0 and 1.2 mEUR) with higher growth rates (10.49

and 9.71%) and have slightly lower leverage levels (0.79 and 0.84). Treatment firms also hold fewer current assets and slightly more current liabilities. The asset and debt composition of the treatment firms is in line with the aggressive working capital management policy defined by Pais & Gama (2015) and García-Teruel & Martínez-Solano (2007). Aggressive working capital management implies utilizing more short-term financing and reducing the value of short-term assets to generate cash. The literature finds conflicting views on which strategy is linked with more profitability. Aggressive management via reduced investment can generate more profits, yet keeping a minimal level of inventories can pose vulnerability to shocks. Conservative policy (or investment-based) can benefit from the reduced cost of interruptions due to more current assets but can also limit liquidity (García-Teruel & Martínez-Solano, 2007).

The preliminary results raise the question of whether factoring lenders give the factoring credit lines to firms that have already posted better results in terms of profitability, growth, and leverage, or whether these results are achieved after using an alternative working capital instrument such as factoring. Therefore, in the further sections, we try to explain the effect of factoring adoption and performance differentials with regression analyses.

Panel C. Treatment and control group performance, median values 2011-2021 (95th % winsorized values)

	ROA	CAR	CLR	Debt-to-assets	Revenue growth	Revenue
Treatment	7.62	0.58	0.58	0.79	10.49	2,007,069
Control	7.43	0.66	0.54	0.84	9.71	1,234,108
N	1,002	1,003	999	995	894	1,001

Correlation matrix

Panel D shows the Pearson correlation matrix for the regression variables defined in the previous section. Coinciding with previous literature, significant positive relationships are found between ROA and all control variables except debt-to-assets and log assets. While debt-to-assets has a negative relationship in all previously mentioned literature (debt increases tend to deteriorate firm profitability), the negative relation between size and ROA is subject to discussion. García-Teruel & Martínez-Solano (2007) and Lyngstadaas & Berg (2016) find a positive relationship with size or log assets, contrary to our results. Research conducted by García-Teruel & Martínes-Solano (2010) and Lee (2009) explains that larger firms tend to be more profitable than smaller firms, possibly because of scale economies and better access to capital markets. However, Goddard et al. (2005) found a negative correlation between size and profitability, which could be due to greater

diversification leading to lower profitability or managers expanding firms for personal gain, as noted by Dyck and Zingales (2004).

As regards other variables, positive current liabilities ratio (CLR) and profitability correlation imply that higher levels of current liabilities could stem from a higher volume of purchased goods, which could be linked to an increase in sales and profitability (Pais & Gama, 2015). The positive relation between the current assets ratio (CAR) and ROA suggests that maintaining current assets can serve as a protective cushion, for example, by ensuring an adequate level of inventory, which may lead to future sales and enhanced profitability (Pais & Gama, 2015). Finally, revenue growth affects ROA positively as seen from the pecking-order theory (Donaldson, 1961), which proposes that profits being reinvested in profitable opportunities within the firm result in a positive correlation between sales growth and profitability.

Interestingly, our introduced variables Factoring and Treatment indicator show a negative correlation with ROA, indicating that factoring adoption has a negative impact on ROA, contrary to the previous literature suggesting alternative financing instruments boost ROA.

As regards multicollinearity, no immediate concerns are raised as the highest correlation shows 0.64 between the dummy variables and no other metric exceeds 0.57, thus respecting the 0.7 threshold.

Panel D. Pearson correlation matrix								
	ROA	Factoring	Treatment indicator	Log assets	Revenue growth	Debt-to-assets	CAR	CLR
ROA	1.00							
Factoring	-0.02	1.00						
Treatment indicator	-0.07**	0.64***	1.00					
Log assets	-0.11***	0.14***	0.16***	1.00				
Revenue growth	0.34***	-0.01	-0.10***	-0.19***	1.00			
Debt-to-assets	-0.34***	-0.05	-0.02	-0.23***	0.03	1.00		
CAR	0.12***	-0.06*	-0.07**	-0.37***	0.15***	0.26***	1.00	
CLR	0.12***	0.07**	0.03	-0.29***	0.05	-0.09**	0.57***	1.00

$^{*}\ p < 0.10,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

DID regression

We run a difference-in-differences regression with time and industry fixed effects as well as clustering of standard errors at the company level to avoid any correlation within each company's observations. The F-statistic shows a low probability value indicating that at least some

of the independent variables are significantly associated with the outcome variable, and the R-squared indicates that the model explains about 30% of the variability in ROA.

When interpreting the treatment indicator variables, we find conflicting results with previous studies on Chinese, Pakistani, Portuguese, Spanish, Norwegian, and other SME markets, which show a positive impact on ROA through working capital management. The Factoring variable (takes the value of 1 for all treatment firm-years and 0 for all control firm-years) does not have a statistically significant value. This indicates that the small and statistically insignificant coefficient of the Factoring dummy has no meaningful difference in ROA between the treatment and control groups before the treatment started, meaning the groups were matched successfully on observable and unobservable characteristics that could affect the outcome. As regards the Treatment indicator, it allows the regression model to capture the interaction between the treatment group and control group for the post-treatment period. The values for all periods (T0, T+1, and T+2) are significant and negative with the effect becoming more significant and more negative as the years after factoring increase. This implies that firms which adopted factoring saw their ROA lower by 2.48pp during the same year of factoring adoption, lower by 2.53 the year after factoring adoption, and lower by 2.81pp 2 years after factoring than their non-factoring peers.

All control variables except CLR are statistically significant and show the expected coefficients, coinciding with previous literature. Firm size has a negative relationship with profitability in our Latvian SME sample, which points to the diversification issues, as mentioned by Goddard et al. (2005), or productivity issues, as discussed by Krasnopjorovs & Kovalovs (2021), who highlight productivity challenges in large companies compared to micro companies. According to their research, some micro companies have higher productivity levels than most large companies. In fact, most employees in large companies work in organizations with below-average productivity. As regards other variables, revenue growth is positively associated with ROA as profits generated tend to be reinvested, the current assets ratio is also positively linked as a higher level of inventories ensures a smoother sales process, and the level of leverage hinders ROA.

Our regression results indicate that the coefficient estimate for the variable Debt-to-assets is overstated when using the winsorized data. To address this issue, we removed the winsorizing procedure and re-estimated the model. The new results suggest that the coefficient for debt-to-assets becomes more normally distributed, indicating that the winsorizing procedure may have introduced some bias (-14.84 vs -4.22). However, this model specification removes the

significance of the Treatment Indicator while its coefficients remain similar. The model also loses R-squared, which prompts us to maintain the initial model despite the observed overestimation of the coefficient of debt-to-assets.

As regards the Factoring and Treatment Indicator, the ROA effect is opposite to the abundance of literature suggesting that supply chain financing instruments and working capital management improve profitability. However, our findings do coincide with those of Singh & Kumar (2017) on Spanish SMEs, who put forward an argument that companies with better performance (those eligible for supply chain financing) can also get additional outside funding to invest in other assets. This might distort the ROA figures. We will build upon this theory in the following results discussion section.

We argue that the fundamentals of our study look from a different angle. While the previous studies measure the independent variables as components of the cash flow cycle (days of receivables, days of payables, etc.), which provide significant negative beta coefficients on ROA in all studies, implying that shortening of the cash cycle boosts profitability, we show whether Latvian micro and SME firms have been able to effectively utilize the working capital management product - factoring.

Panel E. Difference-in-differences regression output (all values winsorized at 95th %)			
	(1)	(2)	(3)
	ROA	ROA	ROA
Factoring	1.360	1.125	0.969
	(1.741)	(1.657)	(1.574)
Treatment indicator	-2.477*		
	(1.438)		
Treatment indicator 1		-2.534*	
		(1.451)	
Treatment indicator 2			-2.807**
			(1.357)
Log assets	-0.891*	-0.895*	-0.897*
	(0.504)	(0.503)	(0.504)
Revenue growth	0.0927***	0.0933***	0.0933***
	(0.0131)	(0.0131)	(0.0132)
CAR	6.167*	6.147*	6.128*
	(3.223)	(3.224)	(3.215)
CLR	-3.502	-3.446	-3.404
	(3.633)	(3.610)	(3.627)
Debt-to-assets	-14.84***	-14.85***	-14.85***
	(2.120)	(2.112)	(2.120)
Year=2012	0	0	0

	(.)	(.)	(.)
Year=2013	2.311	2.598	2.425
	(1.867)	(1.891)	(1.875)
Year=2014	-0.287	-0.104	-0.139
	(1.909)	(1.916)	(1.910)
Year=2015	0.314	0.460	0.298
	(1.900)	(1.904)	(1.893)
Year=2016	-2.028	-1.823	-1.995
	(1.996)	(2.019)	(1.982)
Year=2017	0.0659	0.270	0.176
	(2.142)	(2.152)	(2.129)
Year=2018	3.582	3.693[*]	3.612[*]
	(2.159)	(2.177)	(2.167)
Year=2019	3.150	3.369	3.206
	(1.989)	(2.040)	(1.997)
Year=2020	3.344[*]	3.500[*]	3.459[*]
	(2.011)	(2.027)	(1.998)
Year=2021	4.770[**]	5.088[**]	5.048[**]
	(2.167)	(2.226)	(2.212)
Constant	29.97[***]	29.81[***]	29.95[***]
	(8.286)	(8.241)	(8.258)
Observations	890	890	890
R^2	0.303	0.303	0.304

Robustness

To test for multicollinearity among the independent variables of the regression, we estimate the VIF (Variance Inflation Factor) test. We confirm that there are no VIF estimate values exceeding 5, and thus no multicollinearity is present (as seen in Lindemanis et al., 2022).

Panel F. VIF test		
Variable	VIF	1/VIF
Factoring	1.92	0.52
Treatment indicator	2.09	0.48
Log assets	1.31	0.77
Revenue growth	1.10	0.91
CAR	1.85	0.54
CLR	1.72	0.58
Debt-to-assets	1.23	0.81
Years		
2013	3.49	0.29
2014	3.69	0.27
2015	3.78	0.26
2016	3.86	0.26
2017	4.00	0.25
2018	4.07	0.25
2019	4.09	0.24

2020	4.19	0.24
2021	3.14	0.32
Mean VIF		2.85

Moreover, we refer to the F-value, R-squared value, and the Treatment indicator statistical significance for all time periods to assume a good model fit. The model is also tested on winsorizing the dependent and independent variables to the 90th, 95th (standard), and 99th percentiles, all of which maintain statistical significance and negative coefficients on the Treatment indicators.

Previous studies on working capital management and profitability have endured an endogeneity problem (Deloof, 2003, García-Teruel & Martínez-Solano, 2007, Pais and Gama, 2015, Lyngstadaas & Berg, 2016). The issue stems from the fact that the decision to manage working capital and the company's profitability are interconnected. Companies that are more profitable have the means and incentive to effectively manage their working capital, and the opposite is also true. Following the previous studies, we use the Hausman test to check for endogeneity on the Factoring dummy variable, which might be influenced by other unobservable variables. By first estimating a year and industry fixed effects OLS regression without controlling for the endogeneity of the same variables as used in the difference-in-differences regression, we obtain the residuals. Next, by estimating a two-stage least squares (2SLS) regression model using the residuals of OLS as an instrument for Factoring, a Hausman test is performed to test whether the two sets of estimates are statistically different (see Appendix 6). We find no presence of endogeneity as the test shows the null hypothesis, which states that there is no systematic difference in the coefficients obtained from the two methods, cannot be rejected as the p-value is very high (0.9985). If no endogeneity is present, we can assume that the dummy variable is randomly assigned and the decision to adopt factoring is not influenced by confounding factors.

Univariate analysis

To present the basic relation between working capital management characteristics and profitability, we use the univariate analysis, a similar technique seen in Pais & Gama (2015), García-Teruel & Martínez-Solano (2007) and Lyngstadaas & Berg (2016). As such, we dissect the key components comprising the ROA and find compelling evidence of factoring SME

development. Most notably, we find that firms engaging in factoring saw their ROA decrease, but total assets, total debt, and revenues increase.

By all metrics, the businesses using factoring achieved superior expansion than their non-factoring peers (as seen in Appendix 8 and Chart 1). On median terms (50th percentile), treatment firms saw their total assets increase by a staggering 45.7% one year after factoring implementation, whereas their control peers saw a decrease of 28.7%. This is the first indication that factoring firms invested more capital into their assets whereas control firms divested to overcome working capital shortages. This is also supported in previous works by Casey & O'Toole (2014), who find that European SMEs use working capital financing from banks (such as factoring) to facilitate the management of inventory levels and to acquire resources for production purposes. This indicates that treatment firms invest in their working capital. We also see this from the rise in the current assets and cash which are components of the working capital.

The findings of control firms coincide with the work of Deloof & Jegers (1996), who discovered that Belgian companies experiencing a cash deficit tended to decrease their investment in accounts receivable. We observe similar trends for control firms, which divested from their current assets (-12.1% in T+1).

As regards treatment firms, Pais & Gama (2015) mention that increased levels of working capital are needed for growth and long-term survival. We observe this from the revenue growth of the treatment firms, which exceeds that of the control firms one year after factoring adoption (12.2% and 3.9% respectively).

Treatment firm debtors also saw a rapid rise; however, this effect already took place going into T0 (the same year of factoring adoption), suggesting it was more accelerated. This was confirmed by bank experts who mention that access to factoring limits encourages credit sales, and the effect is short to medium-term (see Fieldwork section).

We see that the expansion of the asset side for the treatment firms is mostly financed through debt as the total liabilities grow at a more rapid pace for factoring companies than their control peers one year after factoring introduction (5.5% and -10.8% respectively). This argument is supported by literature on SME and bank relationships. According to Klapper, 2006, in many European countries factoring is offered by traditional banks, as is the case in Latvia. She also argues that factoring enables relationships between banks and SMEs through their factoring liabilities, which might then lead to cross-selling opportunities of additional lending, such as fixed

asset purchases. This argument is also supported by Summers & Wilson, 2003, who say that resulting from the day-to-day communication between banks and SMEs on the management of their accounts receivables, building of credit history, and overcoming information asymmetries on the SMEs clients, the SMEs overcome the main hurdles constraining small firms accessing traditional bank lending.
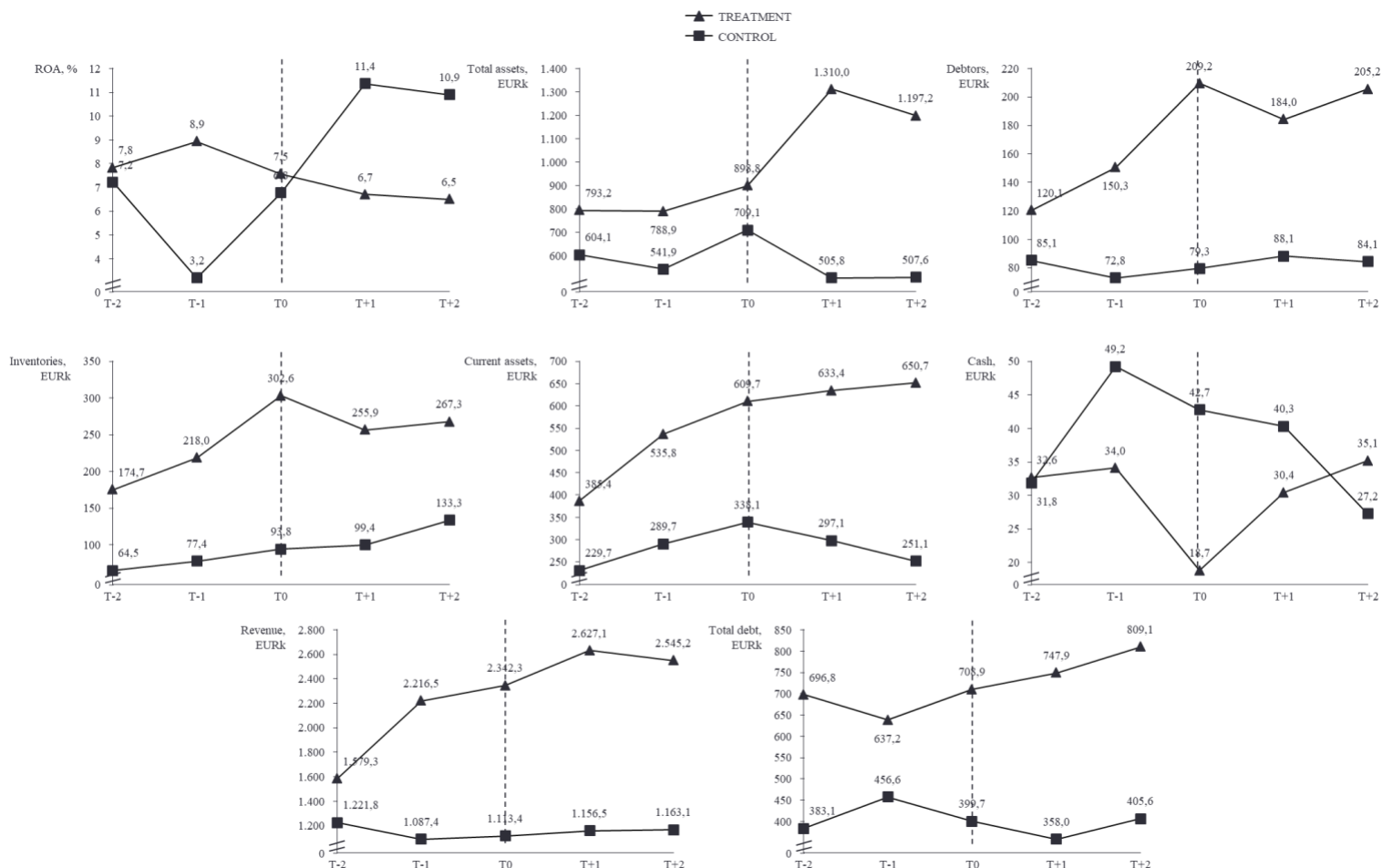
Graph 1. Univariate analysis. Graph by authors

Fieldwork

Having done the quantitative part of our research, we interviewed industry experts (financiers issuing factoring products to SMEs on behalf of their institutions consisting of both banks and non-banks) and C-suite executives, and owners of SMEs that have in the past used or are currently using or wish to use factoring as a means of working capital financing. The aim of

the fieldwork is to gain deeper insight into the factoring market, understand the needs of lenders and SME borrowers, and develop a link between the quantitative results to real-life practices.

In total, we conducted 6 semi-structured interviews, of which 4 were with industry experts, representing the supply side of factoring, and 2 interviews with representatives from different SMEs, representing the demand side of factoring. Industry experts included SME financing specialists from the 2 largest commercial banks in the Baltics and 2 non-bank factoring financiers. Interviews done with the representatives of SMEs covered agriculture and food production industries with revenues in 2021 exceeding 1 mEUR each. The length of the interviews varied from 20 minutes to 70 minutes. Industry experts were questioned on topics such as the size of the factoring market in Latvia and its potential for growth, the main obstacles for SMEs in obtaining factoring and other types of credit, what is important for SMEs when evaluating the attractiveness of factoring, and how the factoring product is viewed by SMEs (the list of guiding questions can be seen in Appendix 9). On the other hand, representatives from SMEs were asked how they decided to use factoring and why, what were the main hurdles in obtaining factoring financing, and what benefits did they experience from factoring (the list of guiding questions can be seen in Appendix 10).

Factoring financing insights – supply side

After having conducted interviews with 2 factoring financiers from 2 different banks and 2 factoring specialists from 2 different non-banks, the first insight we discover from one of the bank experts suggests that the number of firms registered in Latvia currently using factoring financing is around 400 firms, while the factoring specialist from a rival bank argues that the amount is a bit larger. To gather additional insight into the size of the factoring market in Latvia, we reached out to a third factoring expert from another rival bank operating in the Baltics. The third expert confirms that the factoring market in Latvia is roughly 400 firms and is smaller than the Estonian and Lithuanian markets.

Continuing with the non-bank factoring specialists on the size of the factoring market in Latvia. 2 out of 2 agree that the number of firms registered in Latvia eligible for classic factoring financing is much more than 400 firms, thus they argue that the true amount is likely to be 2 to 3 times more. When questioned about the difference between the opposing views about the factoring market size, both bank and non-bank specialists argue that this discrepancy is likely due to banks

being subject to stricter regulations regarding their risk tolerance, therefore, greatly limiting the number of firms that can be serviced by banks.

The most common themes mentioned by all four specialists that hinder the process of factoring issuance were the underlying bureaucracy in the process of credit issuance, the limited financial literacy of SMEs, and the high interest rates of factoring.

As mentioned by the 2 bank representatives, bank internal policies, such as the age of a company cannot be less than 1 year, the firm should be profitable (unless a specific reason exists for the firm to be loss-making), the shareholder's equity cannot be negative, overwhelmingly high leverage, and that accounts receivables should not be collateralized by other loans, are some of the obstacles in the factoring credit issuance process. When asked about how Know Your Client (KYC) and anti-money laundering (AML) procedures affect the factoring financing process, all 4 factoring financing experts mention that zero tolerance policy is enforced similarly to other financing products – no special conditions for factoring are applicable.

Besides bank internal policies, 1 out of 2 experts mentioned that many SMEs are run on a one-off deal basis meaning that there is no consistency or trend in revenues and that often there are large upsurges or sharp sudden decreases in sales that are driven by a single large client. This explains the revenue volatility of SMEs and additional risks for banks. Furthermore, 2 out of 2 bank factoring representatives argue that administrative costs incurred by banks to process the invoices of debtors and to ensure quality checks of the products or services sold are predominately fixed and require intensive work. Therefore, banks avoid providing factoring financing to SMEs whose clients operate on a one-off deal basis (that have no or few recurring payments). This is because banks are not able to benefit from economies of scale, thus making them more costly to issue factoring financing to SMEs whose clients do not have many recurring payments and do not have long-term contracts. One representative of an SME mentioned that it makes the most sense for his firm to use factoring if it has 3 to 4 large clients that represent about 50% of the revenues. Arguing that if debtors are concentrated, the value lies in the large cost savings from having to do less administrative work to process invoices and ensuring quality checks when compared to a case of many small and diversified debtors. The middle ground between these two arguments is that both factoring financiers and SMEs are interested to factorize invoices for large clients with long-term contracts that have recurring payments.

Continuing with other administrative problems brought up by the experts, 4 out of 4 specialists mention the issues associated with factoring being the 3-party-agreement. When an SME is in the process of acquiring factoring financing, it is required for the SME to let its client (the debtor) know that its invoices are factorized. 4 out of 4 experts highlight that often there are cases when a debtor of an SME refuses that its invoices would be factored. Moreover, this occurs quite frequently with debtors that are very large and cash-rich firms. 4 out of 4 experts believe that these large buyers are abusing their market power with no real objective reason not to accept their invoices being factorized. One of the non-bank factoring experts continues by highlighting the fact that these large buyers often have established their own terms for factoring invoices that are unfavorable to SMEs. Furthermore, the expert argues that these large buyers have large negotiation power in their predetermined factoring agreements which can result in payment freezes and abolishment of factoring agreements.

Interestingly is that 2 out of 4 specialists highlight the fact that leading up to 2008 factoring volumes in Latvia were growing at a rapid pace. After the 2008 crisis, factoring volumes dropped sharply and have been recovering very slowly ever since (Appendix 11). One of the experts puts forward the idea that due to the global financial crisis, many clients of SMEs lost their trust since the credit rating of firms operating in Latvia was lowered and insurers refused to insure debtors, thus decreasing demand for factoring financing. As time passed by, factoring became unpopular to finance working capital needs; simply put, businesses forgot about the existence of such a product.

When asked about the factoring market's potential to grow, the expert from the bank argues that the core issue does not lie in the shadow economy, which further limits the number of firms in Latvia eligible to receive factoring financing, but the overall acceptance of factoring. As previously mentioned, 4 out of 4 specialists argue that large firms often do not agree to their invoices being factorized as part of the three-party agreement. Furthermore, 2 out of 4 specialists mention that business partners of SMEs often see the use of factoring as a sign of operational deficiency which, as argued by the experts, is an ill-founded perception that likely stems from the consequences of the 2008 crisis. Experts continue by saying that factoring financing is a good working capital management tool to boost growth even for already fast-growing firms that do not exert any major operational inefficiencies. When questioned about the factoring volume differences between Latvia and its Baltic peers, a specialist from a non-bank financial institution

highlights the fact that factoring products for SMEs in Lithuania historically has been backed by the Lithuanian government, thus making the product less risky for banks in case of defaulted invoice repayments. The specialist continues by saying that in Latvia firms can receive similar guarantees from Altum but these guarantees are predominately issued to exporting firms. As of late, due to geopolitical tensions with Russia and Belarus, according to the expert interviewed, the number of guarantees issued has decreased since many firms were exporting to Russia and Belarus.

On the topic of perception of factoring financing, 3 out of 4 experts note that SMEs in Latvia usually are a one-man show – the founder of the firm covers many functions within the company. Continuing with this narrative, experts argue that because of this phenomenon, there is no or weak specialization within SMEs (no specialization in accounting, sales, legal, and/or other departments) which leads to a lack of financial knowledge. 2 out of 4 experts mention that they frequently encounter business managers and owners of SMEs that do not understand how factoring products work or have never heard about such a product, or mistaken factoring for a different financial product. Experts argue that the lack of financial literacy and business skill often leads to SMEs not trusting financiers or foregoing the opportunity to receive factoring financing, or not seeking credit in the first place.

Finally, all 4 factoring financiers note that factoring is an expensive credit product when compared to other credit products in terms of interest rates and administrative work involved to both grant the financing and monitor it.

Factoring financing insights – demand side

In this section of the research paper, we focus on discoveries and main themes from the interviews with SMEs as well as the insights we gained from the follow-up questions communicated directly to SMEs that completed our questionnaire and indicated that they use or have used factoring or have plans to use it in the future.

When asked why the 2 interviewed SME representatives decided to utilize factoring financing, both argue that the decision in favor of factoring came from internal discussions with the management about the need to solve working capital needs. Representatives continue by highlighting the fact that they had previous knowledge with regards to technicalities of factoring financing as well as that they feel comfortable with their financial literacy since both representatives obtained their higher education in the field of business and economics.

2 out of 2 SME representatives mention that factoring is a financing product to withstand crisis when there is a squeeze on their working capital and debtor days increase. Continuing, both SMEs note that they have used factoring financing during a crisis. Although, one of the SME representatives argues that factoring, in fact, is a good growth product as well due to the shortening of the cash conversion cycle. When asked for their opinion, all 4 factoring financing specialists agree with these arguments put forth by the 2 SMEs.

The most important aspects in the issuance process of factoring, as mentioned by both representatives of SMEs, are the interest rate and the time needed to process all the required documentation to grant the factoring credit line.

When asked about the interest rate on their respective factoring credit lines, both SMEs argue that it is quite high when compared to other credit products. They argue that the interest rate is the most important aspect when determining whether to use factoring or not since, at least in the short term, the high interest rates and fees associated with receiving factoring credit line increase borrowing costs which then negatively affects firms' bottom line. Besides the high interest rates making factoring less appealing, the SMEs mention that the insurance option on factoring only adds to the costs of borrowing which are passed on to SMEs. Furthermore, SMEs note that it is very rare that financial institutions would grant them factoring financing without insuring their debtors. Conversely, an owner of one of the SMEs argued that his firm is ready to bear the extra insurance costs associated with its factoring credit line especially now due to geopolitical tensions that might affect supply chains in unpredictable ways. He continues by stating that a justified increase in borrowing costs to minimize counterparty risk for his firm's largest contracts exceeding 300 kEUR is an acceptable financial decision.

Another detail that both interviewed SME representatives consider being key when acquiring factoring financing is the ease and speed of the documentation evaluation process carried out by the financial institution that is granting the financing. One of the SMEs shares a story where it applied for factoring financing at a local financial institution. One week after the initial application and submission of the required documentation, the firm's application, as communicated by the representatives of the financial institution, was still being evaluated. The company withdrew its application and applied at a different non-bank financial institution for the same factoring credit line. The SME notes that it only took a couple of days for the second financial institution to review its application and debit its bank account with cash. The argument of ease and

speed of acquiring financing is further emphasized by one of the experts sharing a similar case when an SME was in dire need of liquidity and urged that factoring would be issued by the evening of the same day.

Having conducted the interviews, some of the arguments put forth by both the experts and SMEs that hinder the wider acceptance of factoring as a working capital management tool in Latvia are the bureaucracy of banks that impedes the speed of the application review process and the relative expensiveness of factoring to other credit products. Additionally, most of the interviewees mention that the financial literacy of SMEs with regard to the technicalities of factoring products is weak and that further hampers the adoption of factoring.

Both experts from the bank and non-bank financial institutions argue that factoring financing is a costly product for their institutions. Highlighting the fact that during the issuance process of factoring it involves a lot of administrative work. Additionally, the monitoring of debtors requires intensive work. The representatives of SMEs are aware of the bureaucracy within these financial institutions that delays the process of credit issuance but, in fact, this is one of the aspects that SMEs value the most – a swift factoring credit application and issuance process.

The following table summarizes the main findings from our interviews. The table below illustrates what arguments overlapped and differed between the bank and non-bank lenders and SMEs.

	Bank and non-bank financial institutions	Small and medium enterprises in Latvia
Uses of factoring credit	• Working capital management tool during a crisis *(4/4 of experts)*. • Currency risk hedging for SMEs that export *(1/4 of experts)*. • Working capital tool to facilitate rapid growth especially for exporting firms *(4/4 experts)*.	• Working capital management tool during a crisis *(2/2 of SMEs)*. • Working capital tool to facilitate rapid growth especially for exporting firms *(1/2 of SMEs)*.
Size of factoring market in Latvia	• 400 to 500 firms *(1/2 of experts from banks)*. • 1000+ firms *(2/2 of experts from non-banks)*.	SMEs were not questioned on this topic.
Reasons for factoring market underperformance	• Consequences of 2008 crisis: SMEs forgot about factoring, more conservative lending policies *(2/4 of experts)*. • Weak financial literacy of SMEs *(2/4 of experts)*.	• Weak financial literacy of SMEs *(1/2 of SMEs)*. • Conservative lending policy from banks and non-banks *(1/2 of SMEs)*.
Impediments of factoring adoption	• High interest rates *(4/4 of experts)*. • Peculiarities of factoring being a 3-party agreement *(3/4 of experts)*. • Factoring involves a lot of administrative work to monitor debtors and review applications of SMEs *(4/4 of experts)*.	• High interest rates *(2/2 of SMEs)*. • Peculiarities of factoring being a 3-party agreement *(1/2 SMEs)*. • Bureaucracy from the lender side *(2/2 SMEs)*.

Table 7. Expert and SME representative interview summary. Table by authors.

Discussion

We put forward evidence that factoring is a growth product, rather than a profitability one. We present univariate evidence of treatment firms expanding and control firms divesting as part of their working capital strategies. We obtain SME representative views confirming that factoring is a suitable product for the company's growth stage. Multivariate regression analysis implies that factoring has a direct negative profitability relationship based on asset performance (ROA), however, we argue that this effect is distorted due to the investment in assets that takes place after factoring adoption. Investing in assets via debt is a common practice for SMEs, but it is more pronounced for factoring SMEs, which build relationships with banks by engaging in factoring agreements. Factoring relationships help bridge the information asymmetry faced by credit-rationed SMEs due to the constant monitoring of account receivables as part of the factoring agreement administration from the bank side. Bank-SME relationships founded through factoring engagements allow for cross-sale opportunities of traditional lending products for asset purchase in later stages.

Given the positive externalities of factoring, drawing from interviews and univariate analyses, it is important to take up key initiatives at the SME and financier level to curb the lagging factoring adoption in Latvia. Firstly, promoting general business activity is crucial. SMEs need to access financing to gain export competitiveness, globalize Latvia's economy, and attract foreign direct investment. This is done at the policymaker level by supporting the rollout of credit products that do not require or require very little collateral. For example, this can be done by offering tax rebates for these specific credit products. Secondly, offering factoring credit guarantees (as is done in Estonia). Thirdly, adopting harmonized regulations and shared templates for financing products for cross-border activities in the Baltic region. These tools can help solve the issues with insufficient collateral and minimize bureaucracy.

From the perspective of SME debtors, intervention is needed to break up the bargaining power of large local retailers that buy inventory from SMEs. According to the interviews, local grocery retailers, due to their market dominance, allow themselves to be highly selective of their suppliers and impose their financing terms in a three-party factoring agreement issued by a bank. These terms are often unfavorable to SMEs as they allow the retailers to retain parts of the payment, delay payment or not engage in a factoring agreement at all due to the unease of third

parties administering their payment. Discrimination against SMEs due to economies of scale shall not be a factor in payment facilitation and factoring accessibility.

Additionally, drawing from the interviews, the business community can also contribute by critically evaluating the fear and distrust among business partners toward banking products. Representatives shall seek more financial knowledge in opportunities to access capital and accept that banks are willing to collaborate rather than discriminate against them.

Conclusions

Working capital management via factoring, a supply chain financing instrument for reducing the payment days of B2B clients, offers a promising solution for underdeveloped or deleveraging financing markets in support of their local SMEs. As is the case in Latvia, traditionally prudent banking practices and shrinking markets for SME credit open a gap in bank financing. Therefore, demand is growing for alternative financing products that do not directly collateralize SME assets or put covenants on growth, but rather bridge cash flows to ensure operational efficiency. As such, financing products like factoring benefit the SMEs by shifting credit risk to the factor (bank or non-bank lender) and allure to banks as they pledge against SME clients, which are usually bigger and more creditworthy.

As regards factoring relationship with profitability, from a multivariate analysis we find that for a sample of 126 Latvian SMEs, factoring adoption is negatively linked with return on assets (ROA). The negative effect also persists for up to 2 years from factoring adoption. As suggested by previous literature, perhaps Latvian SMEs cannot efficiently utilize factoring, or the increased leverage is associated with lower profitability. However, we also find that the asset base of factoring SMEs expands rapidly after factoring adoption. The asset expansion is partly driven by an increase in current assets to service higher volumes of sales, and partly, by an increased access to long-term debt products for fixed asset purchase as banks see more cross-sell opportunities in their factoring clients. These findings point towards factoring being a growth product rather than a profitability one.

From the conducted interviews, we draw the following insights. For both banks and non-bank financial institutions, factoring is a financial product suited for SMEs at their growth stage, to indirectly help build their asset base and increase long-term profitability and later, as these SMEs build their relationship with their financial institutions, they can receive other types of credit that

requires collateral. For SMEs, factoring is a financial product to weather crises when there is a squeeze on their working capital or, conversely, to grow rapidly, especially in export markets.

Additionally, we find a consensus between the experts and SMEs regarding the impediments of a wider factoring adoption. The main hindrances being the ease and speed of factoring issuance, high interest rates, financial literacy of SMEs, and bureaucracy underlying factoring three-party agreements.

Limitations & further research

We could not account in our regression analysis for the bias of SME representatives when they were completing the corporate firm-level questionnaire. Due to our questionnaire distribution methodology, it was not granted that people within the respective SMEs receiving the survey were familiar with their firm's factoring credit usage. Likely, the people receiving the questionnaire were not C-suite executives, accountants, financial specialists, internal auditors, etc. This could impede the quality and feasibility of the survey results. Additionally, due to factoring not being obliged to report in financial statements, we were not able to cross-check the results of our surveys to the reported periods of factoring usage of SMEs.

Regarding data, due to the concentration on manufacturing and wholesale trade firms within our sample, the results might not be universal – not representative of other industries. Thus, we believe that further research could benefit from studying a sample of SMEs that are less concentrated on industries such as manufacturing and wholesale trade. Additionally, the effect on alternative profitability or operational metrics of SMEs that is due to factoring adoption could be studied.

We also acknowledge the smaller size of our sample, which might produce biased results. We recommend larger-scale research of this kind to confirm the Latvian SME profitability upon adopting working capital management instruments.

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During the process of this research AI tools such as Chat GPT 3 were used to assist in paraphrasing previous literature and writing code in STATA for our regression analysis. We take full responsibility for the content generated.

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Pérez-Elizundia G., Delgado-Guzmán J. A., Lampón F. J. (2020). Commercial banking as a key factor for SMEs development in Mexico through factoring: A qualitative approach. *European Research on Manage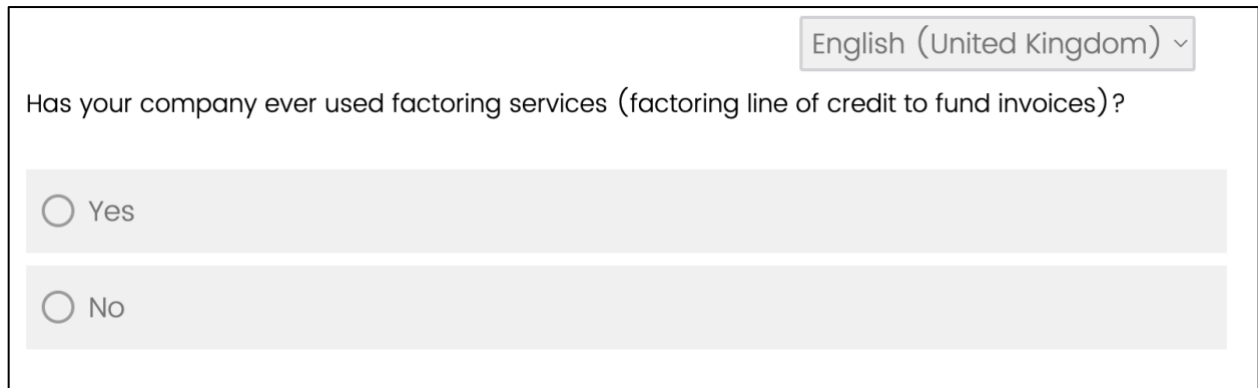ment and Business Economics*. 26(3), 155-163. Retrieved from https://www.sciencedirect.com/science/article/pii/S2444883420302965

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Appendices

Appendix 1. Firm-level questionnaire. Question nr.1. Image by authors. Qualtrics XM factoring survey link, intended for distribution to the sample companies via email: https://sserigaedu.eu.qualtrics.com/jfe/preview/previewId/ad9ff148-7909-4f6d-9641-bb544de4ce77/SV_5aNXIpnIpcy51Hg?Q_CHL=preview&Q_SurveyVersionID=current

Appendix 2. Firm level questionnaire. Question nr.2. Image by authors. Qualtrics XM factoring survey link, intended for distribution to the sample companies via email: https://sserigaedu.eu.qualtrics.com/jfe/preview/previewId/ad9ff148-7909-4f6d-9641-bb544de4ce77/SV_5aNXIpnIpcy51Hg?Q_CHL=preview&Q_SurveyVersionID=current

Appendix 3. Firm level questionnaire question nr.3. Image by authors. Qualtrics XM factoring survey link, intended for distribution to the sample companies via email: https://sserigaedu.eu.qualtrics.com/jfe/preview/previewId/ad9ff148-7909-4f6d-9641-bb544de4ce77/SV_5aNXIpnIpcy51Hg?Q_CHL=preview&Q_SurveyVersionID=current

Appendix 4. Firm-level questionnaire. Question nr.4. Image by authors. Qualtrics XM factoring survey link, intended for distribution to the sample companies via email: https://sserigaedu.eu.qualtrics.com/jfe/preview/previewId/ad9ff148-7909-4f6d-9641-bb544de4ce77/SV_5aNXIpnIpcy51Hg?Q_CHL=preview&Q_SurveyVersionID=current

Appendix 5. Firm level questionnaire. Question nr.5 for companies that answer "no" to question nr.1. Image by authors. Qualtrics XM factoring survey link, intended for distribution to the sample companies via email: https://sserigaedu.eu.qualtrics.com/jfe/preview/previewId/ad9ff148-7909-4f6d-9641

bb544de4ce77/SV_5aNXIpnIpcy51Hg?Q_CHL=preview&Q_SurveyVersionID=current

	(b)	(B)	(b-B)
	ivreg	reg	Difference
Treatment indicator	-1.48	-2.48	0.99
Log assets	-0.85	-0.89	0.04
Revenue growth	0.09	0.09	0.00
CAR	6.07	6.17	-0.10
CLR	-3.32	-3.50	0.18
DA	-14.87	-14.84	-0.04
Year			
2013	-1.97	2.31	-4.28
2014	-4.61	-0.29	-4.32
2015	-4.06	0.31	-4.37
2016	-6.45	-2.03	-4.42
2017	-4.43	0.07	-4.50
2018	-1.02	3.58	-4.60
2019	-1.48	3.15	-4.63
2020	-1.36	3.34	-4.70
Industry			
2	0.72	0.63	0.09
3	3.00	3.21	-0.21
4	1.74	1.66	0.08
5	-0.69	-0.42	-0.27
6	-1.54	-1.71	0.17

Test of H0: Difference in coefficients not systematic

chi2(19) = (b-B)'[(V_b-V_B)^(-1)](b-B)

=   5.7

Prob > chi2 =   0.9985

(V_b-V_B is not positive definite)

Appendix 6. Hausman endogeneity test. Table by authors.

Treatment	Industry	Med revenue	Med assets	Med debt-to-assets	Control	Industry	Med revenue	Med assets	Med debt-to-assets	Match	Pair
Treatment 1	M	2116498	819594	0.83	Control 1	M	1018488	1186213	0.75	Industry, asset, D/A Qs	Strong
Treatment 2	H	2428989	1949386	0.88	Control 2	H	1741487	3183005	0.86	Industry, revenue, D/A Qs	Strong
Treatment 3	G	7811497	1716488	0.54	Control 3	G	6441379	1946427	0.61	Industry, revenue, asset, D/A Qs	Very strong
Treatment 4	G	4970307	961443	0.86	Control 4	G	2514394	1090180	1.51	Industry, asset Q	Weak
Treatment 5	G	4098529	1223879	0.64	Control 5	G	5575830	911613	0.60	Industry, revenue, D/A Qs	Strong
Treatment 6	G	716246	297555	0.86	Control 6	G	1125668	254271	0.74	Industry, revenue, asset, D/A Qs	Very strong
Treatment 7	G	1512616	555729	1.00	Control 7	G	3741026	524511	0.92	Industry, asset, D/A Qs	Strong
Treatment 8	G	284386	3934	11.63	Control 8	G	497729	62057	0.90	Industry, revenue, asset Qs	Strong
Treatment 9	G	5349132	460503	0.85	Control 9	G	653973	240703	1.92	Industry	N/A
Treatment 10	G	323015	102040	1.00	Control 10	G	453529	110498	0.91	Industry, revenue, asset, D/A Qs	Very strong
Treatment 11	G	209833	382671	1.05	Control 11	G	527527	187613	0.84	Industry, revenue, asset Qs	Strong
Treatment 12	G	906274	153866	1.36	Control 12	G	966031	124569	1.84	Industry, revenue, D/A Qs	Strong
Treatment 13	G	821269	882496	1.10	Control 13	G	872242	138881	1.71	Industry, revenue, D/A Qs	Strong
Treatment 14	G	712453	607439	0.25	Control 14	G	74687	3296	0.66	Industry, D/A Q	Weak
Treatment 15	G	1486067	561873	0.52	Control 15	G	1301075	1001048	1.29	Industry, revenue Q	Weak
Treatment 16	G	2206420	957218	0.79	Control 16	G	145988	114967	0.94	Industry	N/A
Treatment 17	G	14502890	7284096	1.22	Control 17	G	1630285	1684747	1.27	Industry, asset, D/A Qs	Strong
Treatment 18	G	1264676	258952	0.66	Control 18	G	1319348	326931	0.88	Industry, revenue, asset, D/A Qs	Very strong
Treatment 19	G	2520387	485451	0.33	Control 19	G	374969	72477	0.60	Industry, D/A Q	Weak
Treatment 20	G	1261724	325508	1.02	Control 20	G	907997	141363	0.98	Industry, revenue, D/A Qs	Strong
Treatment 21	F	1180755	572612	1.47	Control 21	F	800098	186303	1.42	Industry, D/A Q	Weak
Treatment 22	C	8974932	11985147	1.38	Control 22	C	13126768	8781836	0.66	Industry, revenue, asset Qs	Strong
Treatment 23	C	4459100	7325463	1.13	Control 23	C	1183506	5061038	0.99	Industry, asset, D/A Qs	Strong
Treatment 24	C	3149594	1660394	0.97	Control 24	C	3956361	2340499	0.74	Industry, revenue, asset Qs	Strong
Treatment 25	C	1671381	1176935	0.62	Control 25	C	472237	347757	0.39	Industry, asset, D/A Qs	Strong
Treatment 26	C	1159661	442455	0.58	Control 26	C	343415	315868	0.42	Industry, asset, D/A Qs	Strong
Treatment 27	C	1055051	441934	0.72	Control 27	C	1256795	288094	0.68	Industry, revenue, D/A Qs	Strong
Treatment 28	C	5358864	2983680	0.84	Control 28	C	5281773	3176383	1.30	Industry, revenue, asset Qs	Strong
Treatment 29	C	623210	170489	0.85	Control 29	C	698514	140185	0.95	Industry, revenue, asset, D/A Qs	Very strong
Treatment 30	C	20735811	15749882	0.68	Control 30	C	391851	30203	0.70	Industry, D/A Q	Weak
Treatment 31	C	13114061	10539070	0.50	Control 31	C	11552756	10739899	0.10	Industry, revenue, asset, D/A Qs	Very strong
Treatment 32	C	8734498	5986074	1.33	Control 32	C	751388	178213	1.44	Industry, D/A Q	Weak
Treatment 33	C	1228546	1356328	0.87	Control 33	C	283403	114798	1.01	Industry	N/A
Treatment 34	C	1187266	487449	1.08	Control 34	C	3428175	582615	1.09	Industry, asset, D/A Qs	Strong
Treatment 35	C	874273	243394	0.99	Control 35	C	426758	274277	0.31	Industry, asset Q	Weak
Treatment 36	C	2577932	2495675	0.66	Control 36	C	808219	309309	0.71	Industry, D/A Q	Weak
Treatment 37	A	740939	667518	0.73	Control 37	A	759971	1182989	0.76	Industry, revenue, D/A Qs	Strong
Treatment 38	A	688534	946653	0.55	Control 38	A	586776	388720	0.95	Industry, revenue Q	Weak
Treatment 39	A	166580	217788	0.44	Control 39	A	349972	378579	0.86	Industry, revenue, asset Qs	Strong
Treatment 40	A	3805381	514610	0.39	Control 40	A	9228316	26499810	0.28	Industry, revenue, D/A Qs	Strong
Treatment 41	A	797481	2066735	0.71	Control 41	A	1262544	2629288	0.39	Industry, revenue, asset Qs	Strong
Treatment 42	A	113603	181783	0.85	Control 42	A	289408	260829	1.85	Industry, revenue, asset Qs	Strong
Treatment 43	A	14626664	7190488	0.66	Control 43	A	6309114	3705675	0.65	Industry, revenue, asset Qs	Strong
Treatment 44	A	2017714	741318	0.55	Control 44	A	2292612	4927222	0.25	Industry, revenue Q	Weak
Treatment 45	A	472514	484965	0.92	Control 45	A	2935416	8030170	0.91	Industry, D/A Q	Weak
Treatment 46	G	22879571	10672267	0.76	Control 46	H	16680980	2822251	1.29	Revenue, asset Qs	Weak
Treatment 47	G	22316615	8070406	0.47	Control 47	F	11920989	18186133	0.62	Revenue, asset, D/A Qs	Strong

Treatment 48	C	10049068	2088896	0.75	Control 48	H	3980866	2718252	0.67	Asset Q	N/A
Treatment 49	C	6569056	4865333	0.74	Control 49	F	1975826	1020454	0.25	Revenue Q	N/A
Treatment 50	C	4200904	2449857	0.79	Control 50	F	3516140	1104775	0.85	Revenue, asset, D/A Qs	Strong
Treatment 51	C	1960071	1706914	0.45	Control 51	H	910139	688470	0.33	D/A Q	N/A
Treatment 52	C	16455916	11187876	0.73	Control 52	F	1712552	1024362	0.74	D/A Q	N/A
Treatment 53	C	1239385	598591	0.86	Control 53	H	1126430	598103	0.78	Revenue, asset, D/A Qs	Strong

Appendix 7. Control and treatment matching based on quartiles. Table by authors.

Treatment	T-2 p50	T-1 p50	T0 p50	*dif*	T+1 p50	*dif*	T+2 p50	*dif*
ROA	7.81	8.92	7.55	*-1.37pp*	6.69	*-0.86pp*	6.49	*-0.20pp*
Total assets	793,184	788,910	898,836	*13.9%*	1,309,975	*45.7%*	1,197,236	*-8.6%*
Debt-to-assets	0.77	0.84	0.78	*-0.06*	0.80	*0.02*	0.82	*0.02*
Revenue	1,579,341	2,216,459	2,342,270	*5.7%*	2,627,119	*12.2%*	2,545,231	*-3.1%*
Cash	32,600	34,033	18,741	*-44.9%*	30,376	*62.1%*	35,118	*15.6%*
Total debt	696,838	637,175	708,882	*11.3%*	747,903	*5.5%*	809,115	*8.2%*
Inventory	174,690	217,997	302,557	*38.8%*	255,919	*-15.4%*	267,347	*4.5%*
Fixed assets	285,881	326,566	329,963	*1.0%*	336,724	*2.0%*	345,174	*2.5%*
Current assets	385,392	535,803	609,668	*13.8%*	633,414	*3.9%*	650,717	*2.7%*
Debtors	120,104	150,250	209,223	*39.2%*	184,020	*-12.0%*	205,216	*11.5%*
N	44	49	51		50		43	

| Control	T-2 p50	T-1 p50	T0 p50	*dif*	T+1 p50	*dif*	T+2 p50	*dif*
ROA	7.21	3.19	6.76	*3.58pp*	11.35	*4.59pp*	10.89	*-0.47pp*
Total assets	604,053	541,887	709,097	*30.9%*	505,801	*-28.7%*	507,564	*0.3%*
Debt-to-assets	0.79	0.88	0.88	*-0.01*	0.84	*-0.04*	0.69	*-0.15*
Revenue	1,221,754	1,087,374	1,113,358	*2.4%*	1,156,545	*3.9%*	1,163,094	*0.6%*
Cash	31,802	49,158	42,742	*-13.1%*	40,255	*-5.8%*	27,225	*-32.4%*
Total debt	383,068	456,570	399,746	*-12.4%*	357,954	*-10.5%*	405,590	*13.3%*
Inventory	64,467	77,378	93,801	*21.2%*	99,440	*6.0%*	133,298	*34.0%*
Fixed assets	248,363	179,180	180,754	*0.9%*	149,177	*-17.5%*	141,883	*-4.9%*
Current assets	229,679	289,695	338,061	*16.7%*	297,147	*-12.1%*	251,102	*-15.5%*
Debtors	85,055	72,801	79,272	*8.9%*	88,069	*11.1%*	84,087	*-4.5%*
N	41	45	50		46		43	

Appendix 8. Univariate analysis. Table by authors.

- Why is factoring important?
  - What are the main benefits of factoring for SMEs?
  - Can factoring address the SME funding gap? If yes, to what extent?
- How do you acquire clients?
  - What position company representatives do you speak with when attracting clients? Who are the decision makers?
  - What are the main selling points that convince SME representatives to be in favor of factoring?
  - What are the main reasons against factoring that potential clients point out?
  - Would you say there is a knowledge gap?
- How large is the factoring market in Latvia? In Baltics?
  - How many companies use factoring, roughly?
  - Is there still capacity to factorize more companies (both in terms of credit supply and credit demand) Cyclicality of credit availability?
- Why is Latvia falling behind in factoring volumes when compared to Lithuania and Estonia?
  - Shadow economy?
  - Business activity?
  - Tax legislation?
- What are the major obstacles faced by SMEs in acquiring factoring?
  - AML issues?
  - Risk industries?
  - Issues with documentation? Do they differ among industries?
  - Insufficient financial metrics?
- How can you improve your service offering to SMEs?
  - Lower interest rates? Is it possible?
  - Insurance on factoring?

Appendix 9. Guiding questions. The list of guiding questions for semi-structured interviews with industry experts. Image by authors.

- How did you come about the idea of factoring?
- How did you find out such a service exists?
  - Did a business partner of yours suggest it?
  - Were you approached by a bank that recommended it?
  - Was it your own initiative to adopt factoring/was it a logical business step?
- What made you decide to adopt factoring?
  - Strong/international/well-known business partners/buyers of your product?
  - Issues with working capital?
  - Was it low liquidity/high CCC?
- What are the main obstacles for you when acquiring factoring/financing?
  - Issues with the quality of debtors?
  - AML issues?
  - How familiar with factoring were you before you adopted it?
- On what functions/how do you use the money gained from factoring?
  - Could you name an example of a specific use for factoring?
- Approximately percentage wise how much of your sales is factorized?
  - Do you wish to increase or decrease that proportion?
- What are some of the initial benefits you have noticed from using factoring?
- Why factoring is important for your business?
  - Lowers CCC?
  - Better reputation among business partners?
  - Higher sales and profitability improvements?
- Do you believe the interest you are paying for factoring is fair?
- Do you wish to use factoring in the long-term?

Appendix 10. Guiding questions. The list of guiding questions for semi-structured interviews with the representatives of SMEs. Image by authors.
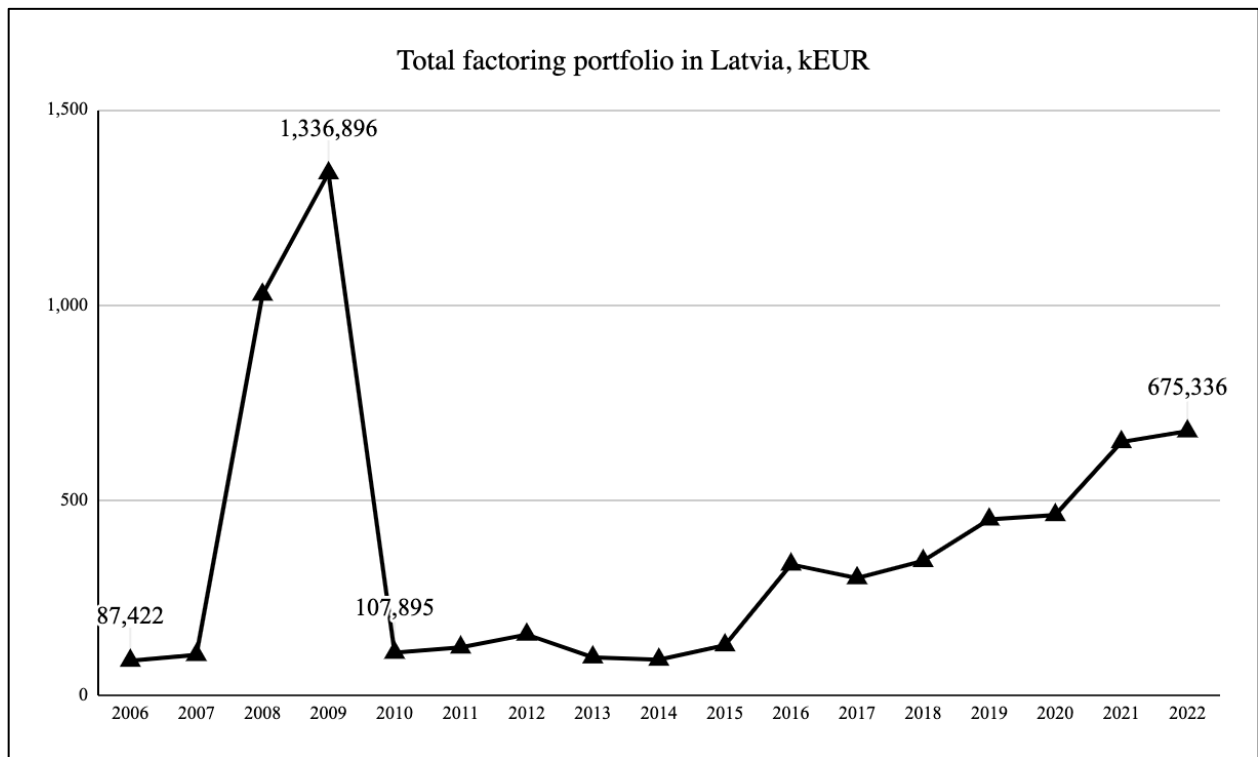
Appendix 11. Total factoring portfolio in Latvia, kEUR at 2022 prices. Graph by authors. Data source:

https://data.stat.gov.lv/pxweb/lv/OSP_PUB/START__ENT__UA__UFL/UFL010c/table/tableViewLayout1/