COVID-19 liquidity crisis: May reverse factoring be the solution to SME financing in Mexico?

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Abstract

Objective: The measures promoted by governments around the world to contain the spread of Covid-19 have caused major disruptions in the procurement and distribution processes of many companies. Restrictions on mobility, delays in the supply chain, shortages, or absence of stock and drastic reductions in customer demand are having a major impact on all economic sectors in the country. In this context, ensuring healthy finances, taking care of solvency, and having timely resources to get through the crisis is essential for any type of company, to be able to meet short and medium-term commitments, such as the payment of employees and suppliers, as well as the rest of its operations and debts. In the current Covid-19 era, reverse factoring (RF) has become one of the few options available to access working capital and can be an ideal option for small businesses looking for quick access to cash without going into debt or guaranteeing fixed assets to alleviate pressures on their financial cycle.
In this sense, the objective of this paper is to analyze whether RF alone could provide the sufficient liquidity that SMEs need during the time that the containment measures are in place, to be able to meet their operating expenses.

**Methods:** To this end, a qualitative study was carried out through in-depth interviews with ten financial institutions (FIs) in Mexico that account for between 60% and 80% of the factoring volume operating in the country.

**Results:** The results of this analysis highlight key elements that allow proposing a combined “Working Capital Loan – RF” scheme attached to one another, such as legal security, efficient client information systems, reduction of requirements to initiate operations or ease of operation and simplification of procedures.

**Limitations:** The implications of this proposal are far-reaching since, through such scheme, FIs, together with public administrations, can actively support the rescue of more than 120 thousand SMEs and protect up to 5.3 million formal jobs, within a robust legal framework, thus contributing to the economy and boosting the bankarization of SMEs on a large scale throughout the country.

**Practical implications:** The originality of this research lies in the proposal to mitigate the effects of Covid-19 that emerges from the analysis of a combined scheme of credit together with RF, framed in the dynamics of buyer-supplier relationships. This work considers aspects of cooperation and a collaborative vision of supply chain finance that go beyond the traditional literature, which has focused on operational aspects. These aspects are crucial to the success of the proposal presented. This study also integrates the perspectives of all players involved in a RF operation, namely buyers, suppliers, FIs, and public administrations.

**JEL Classification:** M10; M19; G21; G30; G43

**Keywords:** Supply Chain Finance; Reverse Factoring; Determinants; Working Capital; SME, Covid-19, Mexico.
COVID-19流动性危机：反向保理能否解决墨西哥中小企业融资问题？

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文章摘要
研究目标：本研究的目标是从所有相关方的角度确定反向保理的决定因素，即买方、供应商、金融机构（IF）和公共行政部门，并在COVID-19造成的遏制措施期间，向墨西哥的中小企业供应商制定一项有效部署财政资源的提案。

分析方法：本研究通过对墨西哥8家金融机构（IF）的深入访谈进行了一项案例研究，这些金融机构（IF）占该国保理业务量的60%至80%。为了解读访谈中获得的信息，本研究在MaxQDA Analytics Pro 2018的支持下，使用了内容分析技术。

研究结果：本研究指出了反向保理的决定因素，在综合融资解决方案的关键要素强调了反向保理和流动资金信贷计划，并考虑了传统文献之外的供应链融资合作，文献主要注重操作层面。

研究局限：与其它案例研究一样，如果不根据其概况和背景进行调整，此研究无法将结论推广到所有金融机构（IF），因此必须通过进一步的研究来验证理论。
实际应用：根据此研究的结果，金融机构和公共行政部门都可以通过积极支持拯救12万多家中小企业并保护多达530万个正规就业机会，从而为经济作出贡献，并在全国范围内推动中小企业大规模银行化。

关键词：反向保理；营运资金信贷；中小企业，COVID-19；墨西哥。

JEL 分类号: M10; M19; G21; G30; G43
Introduction

Following the devastating health and economic crisis caused by Covid-19, the global economy appears to be emerging from one of its deepest recessions and beginning a subdued recovery. One of the most important and apparent obstacles is the reduction in market demand for goods and services in most countries due to absolute or partial lockdown. This lockdown has also disrupted both domestic and foreign supply chains. As a result of that, this pandemic causes significant job losses which will drive down demand, going to lead to a serious comprehensive economic crisis. Following a collapse last year caused by the Covid-19 pandemic, global economic output is expected to expand 4% in 2021 but remain more than 5% below pre-pandemic projections. Downside risks to this baseline predominate, including the possibility of a further increase in the spread of the virus, delays in vaccine procurement and distribution, more severe and longer-lasting effects on potential output from the pandemic, and financial stress triggered by high debt levels and weak growth (International Monetary Fund, 2021). In Mexico, the effects of the crisis were soon felt, resulting in a GDP contraction of 8.5% in 2020. To slow the spread of the coronavirus, the Mexican Government declared a health emergency and implemented a series of health measures, including travel restrictions, social distancing, school closures and the suspension of non-essential activities. (International Monetary Fund, 2021). Based on estimates from all the Ministry of Finance, the Central Bank and the International Monetary Fund, Mexico’s recovery for 2021 is expected to be in the range of 3.3% to 4.6%.

Traditionally, the demanding conditions imposed on suppliers in supply chains in operational terms (delivery times, productivity) and assumption of responsibilities (product innovation), have made financing a key aspect in production chains (Phol & Gomm, 2010; Gelsomino et al., 2016). On top of that, the pressure on suppliers’ working capital caused by the Covid-19 pandemic has been a significant concern to the business community, as it has created significant implications for physical and financial supply chains as corporates reconsider their contingency arrangements and the nature of resilience in the new normal (Pakcan & Latif-Schmitt, 2020). The impact is particularly severe to small and medium-sized companies (SMEs) due to their higher levels of vulnerability and lower resilience relative to their size (Pérez-Elizundia & Delgado-Guzmán, 2020). In fact, the crisis faced by SMEs represents a risk to the stability of supply chains that could aggravate the problems of the global economy. (Global Trade Review, 2020). That kind of risk wreaks havoc on traditional supply chain planning: the process for determining production levels, raw-material purchases, transport capacity, and financing conditions, among other vital factors (Kumar & Mishra, 2020).

According to Mexico’s Institute of Statistics and Geography (Instituto Nacional de Estadística, Geografía e Informática, 2019), SMEs represent the segment of the economy that contributes the largest number of economic units (99.8%), employed personnel (69.4%) and contribution to GDP (52.2%). Hence the relevance of this type of companies and the need to strengthen their performance through credit since they have a substantial impact on the overall performance of economies. Among the most
relevant characteristics of Mexican SMEs is their smaller size, since most of them have ten or fewer employees (95.0% in the case of Mexico). This aspect conditions Mexican SMEs, with less capacity to face investment processes and improve their operating processes, and has characterized them by low productivity, low adoption of innovation and limited technological development (Flores et al., 2009; Saavedra & Saavedra, 2014).

Financing continues to be one of the main obstacles faced by SMEs in Mexico for their development, especially in the current environment marked by Covid-19, which is why commercial credit and other means of non-formal financing has gained relevance (Hill et al., 2017). The lack of credit, coupled with power asymmetries in productive chains, results in the imposition of long payment terms and financing costs are transferred to suppliers located at lower levels of the supply chain. This can result in a decrease in product quality, delayed orders or reduced operating inventories. The result implies risks for the whole supply chain, including large buyers (Pérez-Elizundia et al., 2021).

This new context calls for innovative solutions and new technologies, which have the power to support suppliers in a wide range of circumstances and across the payments’ continuum, while helping to improve efficiency, visibility, and control for both buyers and suppliers (Pakcan & Latif-Schmitt, 2020). Financial institutions (FIs) constantly work on innovative products aimed at SMEs, some of which can be found in the realm of Supply Chain Finance (SCF) (Gomm, 2010; Wuttke et al., 2013; Ali et al., 2020) and related products such as reverse factoring (RF) (Gelsomino et al., 2016, Tian et al., 2020). Through RF, suppliers obtain liquidity, not based on their own credit profile, but on the value of accounts receivable from a more financially sound buyer. In this way, FIs manage to transfer the credit risk from the small supplier to the large buyer, and thus SMEs can access working capital financing at a substantially lower cost than their own credit profile would allow them to do so (Klapper, 2006; Tian et al., 2020). Although the literature suggests that factoring improves the performance of supply chains by facilitating access to liquidity for suppliers (Tanrisever et al. 2012; Grüter & Wuttke, 2017), in practice, the process of adopting this means of financing is complex and slow.

Based on the above considerations, the research objectives are to identify the determinants of RF and to draft a proposal that will allow a more efficient deployment of financial resources to SME suppliers in Mexico. This will allow both FIs and the public administration to take specific actions to facilitate a more efficient deployment of financial resources to this type of companies to operate their working capital through RF, so that banks can fulfill their main mission of financing small and medium-sized entrepreneurs. To address the research objective, this article is structured in three sections. The first section reviews the general impact of Covid-19 on supply chains, provides a brief overview of the Mexican context in the face of the pandemic, and identifies the determinants of RF adoption recognized by the recent literature. The second section presents the empirical work that analyzes the main interrelationship of RF determinants that condition its adoption and operation and
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sets the theoretical foundations for a financing proposal to SMEs that contributes to maximize their opportunities to survive the Covid-19 crisis. The third section presents a proposal for financing SME suppliers through a combination of working capital loans together with RF. The article ends with the conclusions and main implications of the research.

1. Conceptual Framework

1.1 Implications of Covid-19 on global supply chains

The impact of Covid-19 on the global economy is unique as it has not only affected demand, like crises of the past, but has also severely restricted cross-border supply chains. The disruption to the global supply chain will be evidenced by reductions in worldwide import and export volumes, alongside diminishing financial performance of firms and the market’s negative sentiment towards some private and public companies, and therefore will be a critical factor that will weigh on the creditworthiness of some sectors (S&P Global Market Intelligence, 2020). Such disruptions have highlighted the interconnectedness between countries through global value chains (GVCs) and renewed the debate on costs and benefits of globalization. Although efficiency gains stemming from GVCs are well established in the literature (e.g., economies of scale), questions are being raised about whether the gains from deepening and expanding international specialization in GVCs outweigh the associated risks and instability in a context of continuous lockdowns. The debate has evolved around the issue of how to improve stability and resilience to shocks in GVCs while still capturing efficiency gains stemming from specialization and comparative advantage (Organization for Economic Cooperation and Development, 2021).

The crisis caused by the pandemic has brought to light different weaknesses in supply chains (e.g., stock breakages or stops in production activity) (Kumar & Mishra, 2020), leaving firms in a situation of severe financial difficulties, which calls for deep changes in the supply chain management in the immediate future (Ishida, 2020). Understanding where a company’s critical supplies are coming from and the creditworthiness of those suppliers can be essential to assessing the health of that company. Depending on how integral a supplier is to the company, a sudden reduction in supplies can transmit operational and financial stress, especially if the company cannot find an alternative supplier before current inventory is fully depleted. (S&P Global Market Intelligence, 2020).

Before the Covid-19 pandemic, corporate treasuries appeared to be primarily focused on improving efficiencies (especially in relation to receivables flows) and optimizing working capital and costs. Buyers had the power to extend terms and shift working capital pressure on to suppliers. At the same time, while small and medium-sized enterprise (SME) suppliers faced some funding challenges, many appeared to be able to leverage buyer-backed programs if necessary. The experience
of the Covid-19 pandemic and government-imposed lockdowns, designed to help slow its spread, has had a transformative effect on how corporates view their supply chain and have consequently changed their priorities. To a large extent, Covid-19 has exacerbated existing trends in the financial supply chain: those SMEs that already faced significant challenges in accessing finance at an affordable cost now find it difficult to access finance at all, as the risk environment has worsened, and liquidity has tightened in the marketplace. Clearly, the impact on the financial supply chain has varied significantly by industry (Pakcan & Latif-Schmitt, 2020). Amongst the set of industries exhibiting highest increase in credit risk, include automobile, capital goods, consumer products (durable), airlines, and hotel & restaurant have all shown a particularly high vulnerability. The least affected sectors, in turn, have been pharmaceuticals, healthcare and utilities (S&P Global Market Intelligence, 2020). Overall, many corporates have had to reassess the sustainability of their suppliers.

While the pandemic appears far from over, many countries and regions have begun to review lockdowns and allow the resumption of economic activity. It does appear clear, however, that Covid-19 will be with us for some time, with sporadic outbreaks and consequent local lockdowns a possible reality for the foreseeable future. Corporates will not want to be unprepared again: as a result, there are likely to be significant long-term changes to physical and financial supply chains, and greater adoption of digitization. In terms of physical supply chains, there could be permanent geographic shifts as corporate seek greater diversification of suppliers. There will likely also be greater consideration of logistics routes and contingency arrangements in the event of existing supply disruption. Increases in inventory could potentially become permanent, reversing the decades-long shift towards just-in-time inventory management in many industries. To further safeguard the supply chain, industry leaders will need to consider increasing their commitment to suppliers. As corporates seek to adapt to the new normal, many may be looking to their banks for ways to help identify and deploy appropriate payment solutions to drive supplier adoption and maximize financial benefits and process improvements (Pakcan & Latif-Schmitt, 2020).

Ratings agencies and regulators have long feared that supply chain finance (SCF) might not survive an economic downturn, not least if liquidity-starved banks start pulling funding lines. However, since the outbreak and rapid spread of Covid-19, demand for SCF has soared and funding appears to have remained resilient. According to the World Supply Chain Finance Report (2021) the market for SCF has grown by 35% in volume in 2020 compared to 2019 reaching USD 1,311 billion. The amount of funds in use as at the end of 2020 is estimated at USD 505 billion, an increase of 42%. In fact, the rate of volume growth during 2020 appears to have accelerated and the level of adoption and development of digitalization technology has also sped up in the strive to support fragile supply chains and get funding to smaller suppliers. In fact, both banks and large buyers – with government help – have been trying to keep supply chains alive. The issue, then, is what comes next, with ratings agencies continuing to push for reforms around disclosure of SCF programs in the buyers’ balance sheets to achieve higher transparency for investors. Yet, fear
is around disclosed programs, where trade debt may be automatically reclassified as bank debt. In this context, Global Trade Review (2020) promotes RF as a way of maximizing payment terms without causing a squeeze on liquidity further down the supply chain but add a caveat: buyers must now look to “exploit better data”. With massive amounts and new sources of data now available, large firms should be using this resource to better assess suppliers’ health and viability and then help them. In addition, these buyers should share this operational data with the bank providing financing. That means the banks could accurately assess supplier creditworthiness and, as a result, reduce risk for both due diligence and onboarding purposes. Thus, by better knowing their customers, banks may be able to identify financeable opportunities within supply chains in ways that would have been inconceivable in the past. Global Trade Review’s call for richer data analytics feeds into a trend visible across the wider trade finance industry since the pandemic struck: the need to improve companies’ use of technology. A positive outcome of the Covid-19 crisis has been an acceleration in the move towards digitizing trade solutions, which is expected to make trade simpler, safer, and faster, resulting in better risk management and higher resilience of supply chains.

In Mexico, the effects of the pandemic were soon felt, resulting in a GDP contraction of 8.5% in 2020 and a poor recovery rate estimate of less than 4.5% for 2021. In an effort to reopen the economy, the Mexican Government implemented a set of measures, including a program called "Crédito a la Palabra" in April 2020, focused on companies with personnel registered with the Mexican Social Security Institute (IMSS), that pay their contributions on time and that have not dismissed personnel during the sanitary contingency. The goal of this program consisted of financing of MXN 25,000 pesos (approximately USD 1,250) per business, to be paid over three years, including a three-month grace period. However, of the 645,102 companies eligible for this credit program, only 27% were approved. Besides, the amount of the loan is not sufficient for SMEs, as it would only cover the salaries of 2.5 formal workers, on average, for one month (Organización Internacional del Trabajo, 2020). Subsequently, IDB Invest (a member of the Inter-American Development Bank) together with the Mexican Business Council (an organization of the Business Coordinating Council) formed an alliance to offer RF to 30 thousand micro, small and medium-size companies in Mexico, through RF of up to USD 12 billion. IDB Invest's immediate financing will be USD 250 million in RF lines for Mexican corporations, complementing the USD 300 million in existing lines of this type that IDB Invest has already placed in Mexico. (Interamerican Development Bank, 2021). Despite the considerable efforts to implement the credit program proposed by the government and the RF program proposed by IDB Invest, whose combined value amounts to approximately USD 12.2 billion (equivalent to 1% of GDP), they are far from being able to solve the economic problems faced by companies, especially SMEs, in view of the magnitude of the crisis. Later, this paper takes up both initiatives (i.e., credit and factoring) to propose a combined scheme of both products that could be an effective complement to the solution of the liquidity crisis faced by SMEs.
1.2 Reverse factoring as an alternative to SME financing

From an academic point of view, the analysis of financing supply chains is covered by the theoretical framework of Supply Chain Finance (SCF) (Phol & Gomm, 2010; Gelsomino et al., 2016). Under this framework, aspects related to the management of financing and capital flows are included, as well as specific financing tools and instruments (Gomm, 2010; Wuttke et al., 2013). This theoretical framework incorporates approaches such as supplier finance and working capital management, which are the basis for the analysis of RF in supply chains (Klapper, 2006; Dyckman; 2009; Liebl et al., 2016).

Within this framework, RF is defined as a financial product that allows companies to obtain liquidity, not based on their own credit profile, but on the value of a certain asset generated in the development of their activity, in this case, accounts receivable from a large buyer with good economic solvency. RF involves three parties, the assignor (supplier), the financial intermediary, who acquires ownership of the invoices, and the debtor or obligor (buyer), with the responsibility to pay the legitimate holder of the collection rights when the invoice is due (Pérez-Elizundia et al., 2020). In this financial transaction, the supplier assigns the collection rights of its invoices to a third party (financial intermediary) at a discount, in exchange for which the supplier converts its credit sales into cash sales (Klapper, 2006; Liebl et al., 2016). Buyers benefit from the financial stability they bring to their supplier base and from a potential price reduction by suppliers by passing on the lower financial cost of RF versus other types of financing (Seifert & Seifert, 2011). Therefore, RF generates benefits for all participants, and is not only limited to the optimization of working capital but offers equal opportunities to both buyers and suppliers to reduce certain operational risks of companies and improve their performance (Ali et al., 2020), helps better management, generates stability to the supply chain and financial intermediaries access a larger customer base with a lower commercial effort (Liebl et al., 2016). In general, factoring in Mexico operates under the buyer-centric or RF modality, and through electronic means. This type of RF basically consists of a program for a single buyer, with its suppliers as users (Pérez Elizundia & Lampón, 2020). Although RF has been scarcely analyzed by economic sector, at a general level it has received increasing attention in recent years by SCF researchers (Liebl et al., 2016; Grüter and Wuttke, 2017).

The in-depth review of papers published in the last decade allows us to identify and classify the determinants of RF adoption in supply chains (see Table 1). These papers have analyzed the study of RF from different perspectives, some of them focusing their analysis on a single product actor, for example, the supplier (Grüter & Wuttke, 2017) or public administrations (Mol-Gómez et al., 2018). Other works have incorporated a more integrative view of different actors, such as the buyer or the financial intermediary (Dello Iacono et al., 2015; Liebl et al., 2016). Likewise, some authors have addressed certain determinants affecting the performance of banks in general (e.g., macroeconomic, legal, operational, and credit and risk aspects) that can be applied to the performance of financial intermediaries offering factoring (Jara-Bertin et al., 2014; Arias et al, 2020).
TABLE 1: Summary of the main papers on reverse factoring in the last decade

<table>
<thead>
<tr>
<th>Key aspect</th>
<th>Determinant</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Operations management</td>
<td>• Ease to operate and process management linked to the RF electronic platform</td>
<td>Pérez-Elizundia et al. (2021)</td>
</tr>
<tr>
<td>• Self-interest vs. cooperative motives</td>
<td>• Buyer’ motives (extension of payment terms, price discounts, or economic benefits negotiated with the bank)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supplier’s motives (competitive interest rates, improved balance sheets, and higher liquidity)</td>
<td></td>
</tr>
<tr>
<td>• External variables</td>
<td>• Relationship with regulatory authorities, legal security, and competition</td>
<td>Pérez-Elizundia et al. (2020)</td>
</tr>
<tr>
<td>• Business origination</td>
<td>• High potential sectors</td>
<td></td>
</tr>
<tr>
<td>• Program design and implementation</td>
<td>• Supplier management</td>
<td></td>
</tr>
<tr>
<td>• Operations and technology</td>
<td>• Technological developments</td>
<td></td>
</tr>
<tr>
<td>• Program origination</td>
<td>• Program design (interest rates, liquidity, financial cost)</td>
<td>Tian et al. (2020)</td>
</tr>
<tr>
<td>• Operations and technology</td>
<td>• Accounts receivable management</td>
<td></td>
</tr>
<tr>
<td>• Credit and risk management</td>
<td>• Buyer credit profile</td>
<td></td>
</tr>
<tr>
<td>• Contextual framework</td>
<td>• Availability of financial resources in the market</td>
<td>Huang et al. (2020)</td>
</tr>
<tr>
<td>• Contextual framework</td>
<td>• Legal framework (protection of collection rights) and efficient systems for recording encumbrances on receivables</td>
<td>Mol-Gómez et al. (2018)</td>
</tr>
<tr>
<td>• Program origination</td>
<td>• Program design (payment terms, interest rates, liquidity)</td>
<td>Grüter &amp; Wuttke (2017)</td>
</tr>
<tr>
<td>• Implementation</td>
<td>• Program design (number of suppliers in the program, payment term)</td>
<td>Liebl et al. (2016)</td>
</tr>
<tr>
<td>• Credit and risk management</td>
<td>• Process simplification</td>
<td></td>
</tr>
<tr>
<td>• Cooperation aspects</td>
<td>• Buyer credit profile and &quot;Know Your Customer&quot; process</td>
<td></td>
</tr>
<tr>
<td>• Contextual framework</td>
<td>• Degree of supplier-buyer dependency, trust relationships</td>
<td></td>
</tr>
<tr>
<td>• Program origination</td>
<td>• Accounting and tax treatment on the balance sheet</td>
<td></td>
</tr>
<tr>
<td>• Program origination</td>
<td>• Program design (payment terms)</td>
<td>Lekkakos &amp; Serrano (2016)</td>
</tr>
<tr>
<td>• Implementation</td>
<td>• Program design (program volume capacity, interest rates)</td>
<td>Dello Iacono et al. (2015)</td>
</tr>
<tr>
<td>• Credit and risk management</td>
<td>• Technological complexity of the process</td>
<td></td>
</tr>
<tr>
<td>• Cooperation aspects</td>
<td>• Buyer’s credit profile</td>
<td></td>
</tr>
<tr>
<td>• Contextual framework</td>
<td>• Trust and transparency in the buyer-supplier relationship</td>
<td></td>
</tr>
<tr>
<td>• Program origination</td>
<td>• Program design (payment terms, interest rates, supplier size)</td>
<td>Van der Vliet et al. (2015)</td>
</tr>
<tr>
<td>• Contextual framework</td>
<td>• Legal framework and tax aspects</td>
<td>Milenkovic &amp; Dencic (2012)</td>
</tr>
</tbody>
</table>

Source: Elaboration by the authors
The determinants identified in the literature can be classified into different blocks, depending on the key aspect highlighted in the analysis of the adoption of RF. The first three blocks are linked to the stages prior to the start of the operation of the RF program. Thus, these blocks collect the determinants related to program origination (e.g., payment terms, interest rates or liquidity) (Grüter and Wuttke, 2017; Lekkakos and Serrano, 2016), implementation (Liebl et al., 2016), and credit and risk analysis (e.g., the buyer’s credit profile) (Dello Iacono et al., 2015). Under the fourth block, determinants related to operations and technology (e.g., prerequisites and operational ease) are collected (Tian et al., 2020). A fifth block considers cooperation aspects, where aspects such as trust, transparency, and collaboration in buyer-manufacturer relationships are present (Dello Iacono et al., 2015; Liebl et al., 2016). Finally, a sixth block is the contextual framework, such as the legal and regulatory framework, analyzed from the approach of public administrations regulating this financial product, accounting and tax treatment, as well as market and competition aspects (Milenkovic & Dencic, 2012; Mol-Gómez et al., 2018).

2. Empirical Work

2.1 Methodology and data

To identify and analyze the key determinants of RF in the supply chain, this empirical work had a qualitative approach, through a case study, which was conducted before the Covid-19 pandemic started. The work was directed towards the FIs. They have a deep knowledge of the structure and design of their programs, the operating procedures, and the results of their application. In addition, the decision to conduct the empirical work through the FIs was motivated by access to quality information with a relatively small number of cases. The knowledge and experience resulting from the numerous RF programs that FIs have implemented also allows them to have a view from all perspectives besides their own: that of the buyers as promoters of the programs, that of the suppliers as users of the programs, and that of the public administrations that regulate the financial product. The universe of these suppliers is made up of the members of the Mexican Factoring Association, made up of 18 FIs, including the main commercial banks, which account for close to 90% of the factoring volume operated in the country, managing close to 200 programs with more than 21 thousand suppliers affiliated to them. Given the small size of the study universe (18 FIs), the request for the collection of information was sent to all of them, obtaining eight responses. These eight FIs represent, in volume, between 60 and 80% of the factoring operated in Mexico. Table 2 depicts the data referring to the RF programs of each one of them. Likewise, with these eight participants it was possible to reach the phenomenon of "theoretical saturation", which occurs when new data begin to be
TABLE 2: Data from the financial institutions in the sample, 2018

<table>
<thead>
<tr>
<th>Financial Institution</th>
<th>Number of Reverse factoring Programs</th>
<th>Number of onboarded suppliers</th>
<th>Avg. volume of reverse factoring programs (USD millions)</th>
<th>Market share (Volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20 - 40</td>
<td>2,970</td>
<td>2,500</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>20 - 40</td>
<td>4,320</td>
<td>3,900</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>20 - 40</td>
<td>5,130</td>
<td>4,700</td>
<td>18%</td>
</tr>
<tr>
<td>4</td>
<td>20 - 40</td>
<td>3,780</td>
<td>3,300</td>
<td>12%</td>
</tr>
<tr>
<td>5</td>
<td>20 - 40</td>
<td>3,510</td>
<td>3,100</td>
<td>12%</td>
</tr>
<tr>
<td>6</td>
<td>10 - 20</td>
<td>810</td>
<td>700</td>
<td>3%</td>
</tr>
<tr>
<td>7</td>
<td>10 - 20</td>
<td>540</td>
<td>400</td>
<td>1%</td>
</tr>
<tr>
<td>8</td>
<td>10 - 20</td>
<td>160</td>
<td>200</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Prepared by the authors based on information gathered from interviews and consolidated data from the Mexican Factoring Association (2020).

repetitive and cease to provide new information on the object of the research (Andréu Abela, 2000; Guest et al., 2020).

The profile of those interviewed to collect the information was that of factoring managers. The data were collected through in-depth interviews using a semi-structured questionnaire organized into the six blocks identified in the literature: program origination, implementation, credit and risk, operations and technology, cooperation aspects and contextual framework. For the treatment of the information collected in the interviews, the content analysis technique was used, employing MAXQDA Analytics Pro 2018, which allows coding, categorizing, and establishing relationships of the key concepts contained in the interviews.

2.2 Analysis

The results of the analysis are presented through different outputs of the MAXQDA Analytics Pro 2018: the code matrix, the code cloud and the cooccurrence map. The code matrix presents the relative frequency of occurrence of each code in the interviews, where the size of the symbol is referred to the column to identify the relative level of importance that each interviewee gave to the different codes. The code cloud is used to visualize the relative frequency of occurrence of the codes by means of the font size. The code cooccurrence map, in turn, records the interrelation or overlapping of codes through lines that connect them. The larger the code labels and letters, the more code assignments have been made with a given code.
The sectors in which the interviewees mainly operate are considered strategic for the FIs operating RF, mainly because of the large potential number of users of their programs, especially at lower levels of the chain, typically SMEs. In addition, they highlight the strong activity and capacity to generate resources from large international buyers with high economic solvency that have a direct impact on the low risk of sectors such as the automotive, branded consumer products, energy, industrial, pharmaceutical, public sector, retail, and among others.

Figure 1 shows that the legal and regulatory framework is the determinant with the greatest impact on the adoption of factoring, with 74 mentions (FIs 2 to 6), followed by information technology (1, 5, and 7), program design (1, 5, 6 and 8) and collaboration and mutual support (1, 2, 5 and 7), with 60, 51 and 49 mentions, respectively. Likewise, FIs 1, 4, and 3 are the ones who went most deeply into the determinants, with 108, 94 and 87 mentions, respectively, although with a certain bias towards the legal and regulatory framework; that is, the information provided by these interviewees was the richest in content. Finally, FIs 5 and 7 addressed most of the determinants in a more balanced manner.

FIGURE 1: Relative frequency of reverse factoring determinants

Source: Elaboration by the authors based on the code matrix of MAXQDA Analytics Pro 2018.
FIGURE 2: Determinants from the perspective of each parties involved

Buyer’s perspective:
- Program design
- Information technology
- Credit profile
- Promotion and sales
- Contractual aspects
- Accounting and tax treatment
- Collaboration and mutual support

Supplier’s perspective:
- Information technology
- Legal and regulatory framework
- Collaboration and mutual support
- KYC process
- Product knowledge

Financial institution’s perspective:
- Operations management
- Information technology
- Legal and regulatory framework
- Market and competition
- Risk prevention: KYC process

Public administration’s perspective:
- Accounts receivables registry
- Contractual aspects
- Legal and regulatory framework
- Accounting and tax treatment
- KYC process

Source: Elaboration by the authors based on the cloud code of MAXQDA Analytics Pro 2018.

FIGURE 3: Interrelation of determinants and involved parties in reverse factoring programs

Source: Elaboration by the authors based on the cooccurrence code map of MAXQDA Analytics Pro 2018.

Figure 2 shows that the legal framework is the most important determinant from the perspective of the supplier, FI and public administrations, while information technology is the most relevant from the perspective of the buyer.

The correlation analysis between determinants and actors involved in RF (Figure 3) allows observing the relevance that the interviewees attribute to the determinants.
(highlighting those of greater importance by the size of the code and label) and the
degree of interrelation of the determinants (showed through the thickness of the
line that relates them). The results highlight the impact of the legal and regulatory
framework on contractual aspects between commercial parties, accounts receivables
public registry, and the know-your-customer (KYC) process. On the other hand,
information technologies have an impact on the operational ease of users and on the
degree of competitiveness of FIs. There are also pairs of intrinsically related deter-
ninants such as credit profile and risk prevention, program implementation and
competitiveness, and supplier onboarding and KYC process.

2.3 Discussion of results

This section discusses the most important determinants for adopting and operat-
ing RF in the most agile and efficient way, highlights the implications of Covid-19 in
Mexico, and lays the foundations for a financing proposal that maximizes outreach
to SMEs. In the context of the strategic sectors of RF in Mexico, characterized by
having at least two supply levels, our research highlights that RF should not only be
directed at the first level where large multinational enterprises (MNE) that dominate
the chain are positioned, but at lower levels, and be implemented around smaller
buyers with a good credit profile. RF in Mexico should therefore focus on those
levels where solvent buyers are positioned, whose supplier base is made up of SMEs,
which are the ones that most need this type of financial product to be able to guar-
antee their ongoing operation.

On the other hand, in line with other previous works (Dello Iacono et al., 2015;
van der Vliet et al., 2015; Liebl et al., 2016), our research points out that the determi-
nants related to the operation of RF, from the design of the program to its implemen-
tation and operation, including credit and risk aspects, are relevant when it comes to
guaranteeing the efficiency of its adoption. In this sense, aspects such as operational
ease, the reduction of prerequisites to start operations or the simplification of the
program implementation processes are important. The results of our research also
highlight the need to consider the profile of the users of RF in the supply chain for the
design and implementation of the programs. These targets are domestic SMEs with
little financial culture and with difficulties in understanding and adopting a financial
product that they consider complex from an operational point of view.

Considering the contextual framework of RF, the results confirm the importance
highlighted by the literature regarding the need to operate under a robust legal and
regulatory framework (Milenkovic & Dencic, 2012; Mol-Gómez et al., 2018), and
under a cooperative environment characterized by trust, mutual aid and sharing
information among trade partners (Pérez-Elizundia et al., 2021). From the approach
of the public administrations that regulate factoring in Mexico, the need for a legal
framework that allows RF to operate with fewer restrictions and greater legal cer-
tainty stands out. Also evident is the need for a review of the anti-fraud regulations
imposed by the authorities in Mexico, which have implied excessive additional controls that complicate the adoption process. Our results have also highlighted the cooperative aspects as key determinants of RF to be a solution in the financing of key sectors’ supply chain. The lack of a shared collaborative objective between supplier and buyer, where the latter seeks a financial benefit through RF, rather than the financial stability of its suppliers, is pointed out in our research as one of the main problems for the efficient adoption of RF. So far, the literature has focused the study of the determinants of RF on operational aspects, often obviating the cooperative aspects and the collaborative view of financing in supply chains (Tanrisever et al., 2012; van der Vliet et al., 2015; Grüter & Wuttke, 2017) and the incidence of public administrations on the successful adoption of these programs. Our results, while maintaining the importance of operational aspects in terms of the design and implementation of RF programs, highlight that cooperative aspects are key for this product to enable an equitable financial benefit for the entire supply chain.

Now that the key determinants of RF have been identified, it is important to consider whether this product alone would be sufficient to mitigate the negative effects of Covid-19 on SMEs by providing them with sufficient liquidity. At the beginning of this paper, we have shown that traditional credit carries a high risk of default, as SMEs are traditionally not creditworthy, nor do they have collateral to ensure loan repayment. To that end, SMEs would have to allocate a percentage of their income for loan repayment which, without the appropriate incentives and/or mechanisms, they would be unlikely to meet. On the other hand, although in theory the determinants of RF make its adoption and operation more efficient, the support through this financial product alone would be incomplete since, as most SMEs’ sales during the contingency are minimal (if any), there would be little or no invoices to discount through RF, and therefore would run the risk of going bankrupt during this period due to lack of liquidity. However, if a RF program is attached to the credit program as a repayment mechanism, it would provide the necessary liquidity to SMEs (through working capital loans) and guarantee that, once the containment measures are over, repayment would be made by retaining a percentage of the value of their income through discounts on their invoices (i.e., through RF), as outlined below (Pérez-Elizundia & Delgado-Guzmán, 2020).

3. Proposal

The following is a theoretical proposal whose objective is to provide the minimum liquidity that SMEs need to survive during the time that the containment measures for the pandemic are in effect, and which complements both the Government’s proposal for credit and IBD-Invest’s proposal for RF, both of which are too limited in scope if considered individually. Although the proposal is aimed at all SMEs, it is expected to have a greater impact on those belonging to supply chains in non-essential industries. Under this proposal, the source of repayment would be
guaranteed with accounts receivables through RF, once the sanitary contingency is over and they resume selling goods and services. In this sense, a combined working capital loan and RF scheme attached to one another is proposed, which could be an effective complement to the solution of the liquidity crisis faced by SMEs, in addition to the fact that the support granted by the government is fully repaid in less than one year. This combination of products reflects an initiative implemented by Nacional Financiera under the name of "Credi-Cadenas" in 2003, and later revisited by Pérez-Elizundia & Guzmán (2020). The objective of this program was to cover working capital needs for the operation of SMEs affiliated to a RF program called "Cadenas Productivas", whereby Nacional Financiera granted them loans for up to three times the average amount of the last six months of their accounts receivables, published on the program’s platform, for a term of 12 months, and using RF to guarantee the repayment of the loan in an agile and secure manner. The comprehensive credit and RF proposal requires SMEs to be pre-qualified to ensure that they meet minimum eligibility criteria, including being a supplier of goods or services to a medium or large company with sound moral stand and creditworthiness, having been a client of the bank offering this product for at least 12 months, having a good credit history, and being already onboarded on a factoring platform or, if not, willing to join one. The monthly turnover size of eligible SMEs during a given period (for example, the average of the last six months of 2020) would determine the amount of working capital credit line that the bank could qualify for each one. For the support to be truly effective, it is proposed that both factoring and credit be at zero interest rate, with the government subsidizing financial cost and backing the SME debt at a rate of 70% and the banks 30%. Assuming there was no discount rate, if the supplier discounted an invoice worth USD 10,000, the bank would advance the same amount to the supplier and wait until maturity to receive payment from the buyer.

Under the credit and RF proposal, the eligible SME, a user of factoring, could get a working capital loan equivalent to the average of one month's invoicing, and the source of repayment be a percentage of the value of the invoices discounted in factoring (e.g., 10%). To guarantee full repayment of the loan, the factoring scheme would have to be in automatic discounting mode, so that all invoices published by the buyer on the factoring platform would be discounted immediately, starting one month after receiving the credit (grace period, which in practice would have to be adjusted to the estimated time the containment measures would last) until the credit is paid off, which could occur in less than a year. For example, if a SME supplier's average turnover during the last six months of 2020 amounted to USD 10,000 per month, it would be eligible for a working capital credit facility of this amount. One month after the drawdown of the credit (grace period), if the first invoice published by the buyer on the factoring platform were USD 10,000, it would be discounted automatically, considering the following: Instead of advancing 100% of the invoice value (USD 10,000) to the supplier, as would happen in the case of a traditional RF operation, the bank would advance only USD 9,000. In addition, the remaining USD 1,000 would be retained...
FIGURE 4: Loan – Reverse Factoring Proposal

Source: Elaboration by the authors

TABLE 3: Credit amortization (Figures in dollars)

<table>
<thead>
<tr>
<th>Month</th>
<th>Reverse Factoring</th>
<th>Working Capital Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Discounts</td>
<td>10% applied to the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>loan's outstanding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>balance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cash advance to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>supplier</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>10,000</td>
<td>1,000</td>
</tr>
<tr>
<td>3</td>
<td>10,000</td>
<td>1,000</td>
</tr>
<tr>
<td>4</td>
<td>10,000</td>
<td>1,000</td>
</tr>
<tr>
<td>5</td>
<td>10,000</td>
<td>1,000</td>
</tr>
<tr>
<td>6</td>
<td>10,000</td>
<td>1,000</td>
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<tr>
<td>7</td>
<td>10,000</td>
<td>1,000</td>
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<td>8</td>
<td>10,000</td>
<td>1,000</td>
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<tr>
<td>9</td>
<td>10,000</td>
<td>1,000</td>
</tr>
<tr>
<td>10</td>
<td>10,000</td>
<td>1,000</td>
</tr>
<tr>
<td>11</td>
<td>10,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Source: Elaboration by the authors

by the bank to be applied to the outstanding balance of the loan. Should the amount of the supplier's invoicing remain constant throughout the year, this would mean that the sum of all factoring discounts would amount to USD 10,000 each month, out
of which USD 1,000 would be credited to the outstanding loan balance each month starting in month 2, so that the loan would be paid off in eleven months. The source of repayment of the factoring operations, in turn, would be the buyer’s own cash flows associated with the discounted invoices, through the payments made at the maturity of the commercial term (see both Figure 4 and Table 3).

By successively repeating steps 2 to 6 in Figure 4, it can be observed that, as time goes by, the outstanding balance of the loan decreases at a monthly rate of USD 1,000 until the loan is fully paid off. It can also be seen that the time that elapses between the SME receiving the loan and making the first payment through RF is at least one month, such that the outstanding balance at the end of month 2 is USD 9,000, as depicted in the amortization table below.

Based on data from the World Bank (2020) and Instituto Nacional de Estadística y Geografía (2019) the total value of the proposal combining credit and factoring was estimated, as follows. It is considered that SMEs generate about 36% of GDP altogether, which equals total annual sales of USD 456.8 billion. The most recent census recorded 228 thousand SMEs in the country, which translates into an average sales per company of USD 2 million per year or USD 170 thousand per month.

<table>
<thead>
<tr>
<th>TABLE 4. Average sales per company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company size</td>
</tr>
<tr>
<td>% GDP</td>
</tr>
<tr>
<td>Small</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>Total SME</td>
</tr>
</tbody>
</table>

* GDP (2019) = USD 1,268,871 million
** Total companies (2018) = 4.7 million

* Source: Elaboration by the authors based on World Bank (2020) and Instituto Nacional de Estadística, Geografía e Informática (2019)

<table>
<thead>
<tr>
<th>TABLE 5: Scope of the credit program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company size</td>
</tr>
<tr>
<td>% GDP</td>
</tr>
<tr>
<td>Small</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>Total SME</td>
</tr>
</tbody>
</table>

* Source: Elaboration by the author’s based on World Bank (2020) and Inegi (2019)
The latter figure could be the maximum size of credit a company could receive (see breakdown in Table 4).

Statistically, larger companies are more credit worthy, so if the scope of the proposal is established for 80% of medium-sized companies and 50% of small companies. In this scenario the cost of the program would amount to USD 26 billion, equivalent to 2.1% of 2019 GDP (World Bank, 2021), which translates into an average credit ticket size of USD 206,645, equivalent to one month of sales (see Table 5).

Some of the benefits of this proposal are the following: i) approximately 94 thousand small and 32 thousand medium-sized companies would be supported, ii) 5.3 million jobs and wages would be protected (Instituto Nacional de Estadística, Geografía e Informática, 2019), iii) the economy would be reactivated and government revenues from tax collection would be preserved, iv) government and bank support would be recovered in less than a year, and v) bankarization of SMEs would be boosted on a large scale throughout the country. The proposal could be made selectively and/or in stages, starting with those SMEs that belong to essential sectors at this juncture, such as health, food and non-alcoholic beverages, restaurants, agricultural and fishing production, and transportation. Another option is to start with those SMEs that are currently affiliated to a factoring program, which, according to the Mexican Factoring Association, amounted to 27 thousand in 2017.

It is also proposed that the resources come either from a fund created by the government specifically for this purpose, with guarantees from Nacional Financiera, or from loans with multilateral organizations such as the World Bank or the Inter-American Development Bank. In terms of execution, this would have to be as agile as possible, but with order and structure, to prevent the credits from ending up being non-repayable. Distribution would have to be through commercial and development banks, non-bank FIs, cooperatives and/or savings banks of the highest prestige and reputation. Although this proposal excludes micro-enterprises, the fact of having a form of efficient financing for SMEs implies that they would not depend on financing from their suppliers, typically micro-companies. Therefore, this proposal would have an indirect positive impact on the smallest suppliers, since they would be paid for their raw materials, products, or services in cash, thus creating a rapid and direct reactivation of the country’s economy.

4. Conclusions

With global economies hit by Covid-19 pandemic, the complex web of trade supply chains has become tighter than ever, and thus the time has come to get creative in the world of trade finance. The impact of the economic contractions and trade curbs on companies in Latin America has been profound and has been intensified by a contraction in the availability of financing that has especially affected emerging markets and the weakest link in the value chains, namely the SMEs (Interamerican
Although the global economy is emerging from the collapse triggered by Covid-19, the recovery is likely to be subdued, and global GDP is projected to remain well below its pre-pandemic trend for a prolonged period. Several risks cloud the outlook, including those related to the pandemic and to rapidly rising debt. Decisive policy actions will be critical in raising the likelihood of better growth outcomes while warding off worse ones. Global cooperation will be key in addressing many of these challenges (World Bank, 2021). In an otherwise difficult year for the trade finance sector, providers of SCF thrived in 2020 as buyers and suppliers scrambled to free up liquidity in response to unprecedented disruption. When Covid-19 containment measures were implemented across the world, SCF providers reported a surge in demand. Going forward, whether Covid-19 will accelerate the use of technology in the provision of SCF remains to be seen, as there has not really been enough time since lockdown to see significant changes in the use of technology in payables programs.

The impact of Covid-19 on Mexican supply chains was not long to be felt. These chains, especially those in key sectors in which the main FIs operate RF, are dominated by large MNEs that maintain asymmetrical power relations with most of their suppliers. The Mexican companies in these chains are mostly SMEs located at the lower levels of supply. In the context of the Covid-19 pandemic, the imposition of long payment terms and the transfer of financing costs to these supply levels jeopardize the continuity of many Mexican suppliers because of the difficulty of finding affordable sources of financing and, in the long term, the stability of the entire supply chain. Although the current use of RF is inefficient and its degree of penetration low, the presence of MNEs with large purchasing capacity, great economic solvency, and a broad supplier base, make this financial product a key tool for solving supply chain financing problems.

In line with the determinants highlighted by the literature on the adoption of RF, aspects related to design, implementation and operation are unanimously considered key to improving the efficiency of RF programs. Elements such as product operational ease, reduction of prerequisites to start operations, simplification of processes and information technologies are key to the adoption of RF programs. These aspects are particularly relevant if we consider the profile of the recipients of RF in the supply chain: domestic SMEs with little financial culture and with difficulties in understanding and implementing a product such as RF, which they consider complex from an operational point of view. Likewise, the legal framework is recognized as one of the most critical variables in the literature and contrasted with the results of this research for the efficient adoption of this product in this sector. On the other hand, cooperative aspects have been scarcely addressed in previous literature on factoring adoption. As part of supply chain management, these aspects of cooperation in financing should play a relevant role in the design of RF programs. Thus, the establishment of shared collaborative objectives between buyer and suppliers to achieve financial stability of the supply chain over the objectives of obtaining benefits in payment terms or discount rates by buyers is a key aspect. In addition, RF should be understood as
a form of cooperative financing, reinforcing trust, transparency and long-term collaboration and commitment among all the actors involved, fostering greater linkage in relationships beyond the mere supply of raw materials between the companies that make up the supply chains.

This work has also highlighted that the proposals of both the government regarding credit, and the IBD-Invest regarding RF, are both limited in scope if considered individually and thus unable to mitigate the adverse effect of the containment measures resulting from the pandemic on SMEs. The reason for this is that, as sales by these companies during the contingency are minimal, there would not be enough invoices to discount through RF. On the contrary, by attaching a credit scheme, SMEs would be able to meet their operating expenses for the duration of the containment measures, and subsequently repay the credit once they restart selling, and can discount their invoices in RF schemes, whereby a portion of the advances would be used to repay the credit.

The research has a series of implications for both FIs and Mexican public administrations. For the former, the results indicate that they should design RF programs in combination with alternative credit products, with a vision that goes beyond the commercial one, understanding its objective as that of guaranteeing the stability of the domestic SME supplier base within the supply chains through collaboration and mutual support of all involved parties. For Mexican public administrations, the importance of this research translates into recommendations for public policies to be implemented to improve the performance of RF, within a robust legal framework.

Finally, this research has some limitations, mainly derived from the research methodology, which could be addressed in future research. The main disadvantage of case study methodology is to generalize the results. Extending the study to include more countries, would provide more cases to perform complex analyses to confirm the results of this work. This would enable reinforcing a comparison of the RF adoption between countries with different statuses in key global value chains. Furthermore, the current pandemic situation resulting from Covid-19 is changing some of the supply chain finance paradigms. It would therefore be appropriate to update the perspective of the same participants interviewed in a future research to analyze how key factors in SCF will be changed in the post-Covid-19 era. With respect to the proposal presented, some limitations that would determine the size of the credit program are the following: (i) there cannot be a single model for all companies, since SMEs are of different nature, risk profile and size, (ii) the distribution of resources could not be carried out to all SMEs, since the affiliation of users to factoring programs presents certain operational challenges and compliance with money laundering prevention regulations, and (iii) this scheme is applicable only in those cases where the buyer is a subject of credit, usually large companies with good solvency, which could substantially limit the scope of the program.
References


