

**“FINANCIAL INSTRUMENTS FOR MITIGATING LATE PAYMENT: A SYSTEMATIC LITERATURE REVIEW OF FACTORING AND REVERSE FACTORING”<sup>1</sup>**

**“INSTRUMENTOS FINANCEIROS PARA MITIGAR OS ATRASOS DE PAGAMENTO: UMA ANÁLISE SISTEMÁTICA DA LITERATURA SOBRE FACTORING E REVERSE FACTORING”**

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**ABSTRACT**

**Objective:** The objective of this study is to carry out a bibliometric analysis and a systematic review of the literature on the use of factoring and reverse factoring (RF) financial instruments in mitigating corporate payment delays.

**Background:** Compliance with payment deadlines is a relevant and current issue that concerns companies in all sectors and countries. Any delay in payments, in addition to affecting the liquidity and profitability of companies, negatively impacts the growth of economies.

**Method:** The bibliometric analysis, carried out using RStudio, Biblioshiny and Rank Words software, investigates the main laws and characteristics of articles related to the topic of this research – Bradford (journals), Lotka (authors), Zipf (keywords). In turn, the systematic review seeks to identify knowledge gaps, suggesting an agenda for future research. The articles are obtained from the Web of Science database.

**Results:** Despite the interest shown by Chinese authors, the majority of studies are carried out by European researchers in the Netherlands, Germany and Spain. Therefore, there is an opportunity to investigate the effect of these financial instruments on late payments in companies located in emerging countries. A gap in the analysis of this relationship in terms of macroeconomic aggregates is also identified.

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**Contributions:** This study contributes to the systematization of information scattered in the literature and with the suggestion of a future research agenda for different stakeholders – on the relationship between factoring/RF and companies' payment delays. The academia, market and countries can benefit from this information in structuring investigations, financial decisions and formulating macroeconomic policies.

**Keywords:** Late payment. Factoring. Reverse factoring. Bibliometric analysis. Systematic review.

## RESUMO

**Objetivo:** O objetivo deste estudo é realizar uma análise bibliométrica e revisão sistemática da literatura sobre o uso dos instrumentos financeiros de *factoring* e *reverse factoring* (RF) na mitigação dos atrasos de pagamento corporativos.

**Fundamento:** O cumprimento dos prazos de pagamentos é uma questão relevante e atual que preocupa as empresas de todos os setores e países. Um eventual atraso nos pagamentos, além de afetar a liquidez e rentabilidade das empresas, impacta negativamente o crescimento das economias.

**Método:** A análise bibliométrica, efetuada via *softwares* RStudio, Biblioshiny e Rank Words, investiga as principais leis e características dos artigos relacionados ao tema desta pesquisa – Bradford (periódicos), Lotka (autores), Zipf (palavras-chave). Por sua vez, a revisão sistemática busca identificar lacunas do conhecimento, sugerindo uma agenda para pesquisas futuras. Os artigos são obtidos a partir da base de dados Web of Science.

**Resultados:** Apesar do interesse demonstrado pelos autores chineses, a maioria dos estudos é realizada por pesquisadores europeus na Holanda, Alemanha e Espanha. Assim sendo, verifica-se uma oportunidade de investigação do efeito desses instrumentos financeiros no atraso de pagamento das empresas localizadas em países emergentes. Também se identifica uma lacuna de análise dessa relação em termos de agregados macroeconômicos.

**Contribuições:** Este estudo contribui com a sistematização de informações dispersas na literatura e com a sugestão de uma agenda de pesquisa futuras para diferentes *stakeholders* – sobre a relação entre factoring/RF e o atraso de pagamento das empresas. Academia, mercado e países podem se beneficiar dessas informações na estruturação de investigações, financiamentos e formulação de políticas macroeconômicas.

**Palavras-chave:** Atrasos de pagamento. Factoring. Reverse factoring. Análise bibliométrica. Revisão sistemática.

## 1. INTRODUCTION

According to Paul *et al.* (2012), most companies do not make payments to their suppliers within the terms agreed between the parties. Such delay has a negative impact on the profitability of supplier companies - which do not receive the negotiated amounts within the agreed deadlines. Discipline in payment to suppliers must also be addressed by the public sector. An eventual late payment (LP) can affect the liquidity and profit of the private sector, leading to a higher probability of bankruptcy and lower economic growth (Checherita-Westphal *et al.*, 2016).

Recent examples of large companies in the retail sector with LP problems can be identified in several geographies, such as Bed, Bath & Beyond (BBB) in the United States or Americanas in Brazil. BBB unsuccessfully tried to raise money from investors in the first months of 2023 leading to the file for bankruptcy on April 23 (Kapner & Biswas, 2023). Americanas, in turn, has opted for judicial protection against creditors to continue its commercial activity and financial recovery. On January 11<sup>th</sup>, 2023, they communicated an accounting inconsistency from about US\$ 8 billions. It is related to a financial instrument (FI) known as *forfait* or confirming or reverse factoring (RF) (Gaier

& Bautzer, 2023). The continuity of both companies in the future is very uncertain showing the relevance of LP study.

After invoicing the products, with an extended maturity period, the supplier is paid in advance by a financial institution. Thus, the retailer replaced its supplier liability for a bank debt - which involves interest payment. The problem is that instead of the amount corresponding to interest being included in the result, it was deducted from the suppliers' account, so they ended up inflating retained earnings and, consequently, disguising the company's balance sheet (Klapper, 2006; Kegalj 2022). This situation can be considered as bad management practices or even fraud. According to Kegalj (2022), in response to requests for more transparency in financial statements about forfait or RF transactions, the International Accounting Standards Board (IASB) is proposing amendments to IAS 7 - Statement of Cash Flows and IFRS 7 - Financial Instruments: Disclosures, in order to fill a perceived gap in existing IFRS standards.

The LP issue is not just an exclusive concern of the top management of companies. Due to its relevance to the economy, political decision makers start to dedicate their attention, legislating on this subject. An example is the fact that the European Union (EU) has issued directive 2011/7/EU - establishing measures against APs in commercial transactions (Official Journal of the European Union, 2011). It states that companies have to pay invoices within a maximum period of 60 days after their date of issue - unless expressly agreed otherwise stipulated in the contract.

The LP problem can be mitigated via supply chain finance (SCF) with the use of financial instruments (FIs) such as factoring and RF. Klapper (2006), Gelsomino *et al.* (2019) and Wu *et al.* (2019) mention that these FIs can be a financing alternative for companies with less favorable risk assessments. Otherwise, they cannot obtain funding for the development of their activities. In addition, there are other reasons for using these FIs - companies located in regions with inefficient banking systems or where the cost of traditional bank credit is higher.

Such issues are also a macroeconomic matter. According to Klapper (2006), factoring is a FI more frequent in countries with greater economic growth and development, as well as with better credit information bureaus. The author also mentions a RF program in Mexico, as an alternative factoring technology in countries with poor credit information. Moreover, Obeng (2017) investigates the economic impact of delayed payments caused by liquidity crisis in the EU. The results pointed to the existence of arrears in payment beyond the given credit period, across the different EU member countries. As for Mol-Gómez-Vázquez *et al.* (2018), they verified that - across 25 European countries - local firms are more likely to use factoring FI, if the country has lower levels of governance, being: weaker creditor rights, political instability or high enforcement costs.

Given the above, the objective of this study is to carry out a bibliometric analysis and systematic review of the literature on factoring and RF, considering both FIs to mitigate payment delays. Therefore, the research problems to be answered are: (a) What is the evolution of academic production on this topic?; (b) What are the patterns of collaboration between the main authors, institutions and countries in the analyzed sample?; (c) What are the articles, authors and journals that have the greatest impact on the topic of this research?; (d) What are the main connections between the sample documents? and (e) What are the knowledge gaps related to the use of factoring and reverse factoring in mitigating companies' late payment?

Other literature review papers analyze themes related to this research. Chakuu *et al.* (2019) and Caniato *et al.* (2019) systematically reviews the literature on SCF with the objective of providing some grounding of initial studies and concepts, as well as clarifying the relationship between SCF actors, instruments, and contextual factors. Besides, Adaku *et al.* (2023) provide a comprehensive overview of research about the phenomenon of delayed payment to contractors. However, none of them investigate the relationship between factoring and RF to late payment. Another differential of this study is the presentation of a (sub) categorization matrix in which there is the definition of

regression (in) dependent variables, as well as the finance theories that support the relationship between them. The regression analysis is concerned with statistical dependence, while the theories provide the causal connection between both variables.

To the best of our knowledge, this is the first study to conduct a bibliometric analysis and systematic review of the relationship between the use of factoring/RF and corporate LP. For academia, it contributes by presenting the main aspects of articles, authors and journals, as well as the patterns of collaboration between researches related to this topic. In addition, it points to possible knowledge gaps that influence the results of this relationship – e.g., theories, methodological approaches, etc.

Companies, investors and other stakeholders can benefit from the results of this work by identifying the FI and macroeconomic control proxies that best clarify the relationship with corporate LP. Finally, governments and regulators can benefit from the conclusions of this study by establishing micro(macro) economic policies that better fit to LP mitigation. The findings as a whole encourage the development of financial products that are more suited to the needs of companies and economies.

## 2. BACKGROUNDS

This section describes the theoretical and empirical backgrounds that link the main research concepts – payment discipline, factoring and reverse factoring.

### 2.1 Main topics

Three main connected topics were identified in the literature. The level of the relationship between them depends on the objective of each research. In the first topic, authors analyzed the payment discipline. According to Salamon *et al.* 2016, payment discipline is considered a company's practice of fulfilling financial obligations toward suppliers in compliance with payment terms agreed. However, around 80% of European companies experience the problem of LP, making this topic relevant and in need of further study (Salamon *et al.*, 2016; Lefebvre, 2023). Such delay has a negative impact on the profitability of supplier companies and lead to financial stress (Zainudin, 2008; Paul *et al.*, 2012).

Other authors claim that LP problem also can lead to an increase in litigation with a loss of trust between the parties involved and, ultimately, to companies' bankruptcy (Caniato *et al.*, 2016; Ahmadisheykhsarmast & Sonmez, 2020). As for Checherita-Westphal *et al.* 2016, in addition to validating the same claims in their study, they also state that - in macroeconomic terms - the LP problem has a negative impact on economic growth.

The second topic is about the role of factoring. Factoring is an FI that allows firms to raise immediate cash, either by selling its account receivables to a third party, or by pledging these receivables as a loan collateral (Klapper, 2006). This FI is widely used, since it is an alternative funding source to bank loans and equity financing (Klapper, 2006; Bilgin & Dinc, 2019). In turn, Mol-Gómez-Vázquez *et al.* (2018) found that factoring is more common among firms that operate in countries that weakly protect the creditors' rights, have political instability or high enforcement costs.

The third topic concerns to the study of RF. This FI offers suppliers access to short-term credit, at a low cost, through the selling of the suppliers' accounts receivable to financial institutions. It does so at a reasonable discount in exchange for cash, according to Huang *et al.* (2019). As for Shou *et al.* (2021), they studied the relationship between RF and operating performance. They point out that RF improves the operating performance of buyer firms in terms of operating margin and cost effectiveness.

## 2.2 Main theories

The two main theories identified in this study are agency theory and transaction cost economics. Agency theory holds that firms are constituted by a set of contracts. In the ideal contract, there should be an alignment or mitigation of conflict of interest between the principals (owners) and their agents (managers), as both parties are engaged in a cooperative partnership (Jensen & Meckling, 1976). According to Dekkers *et al.* (2020), this is not always the case, but the focus of the theory is on determining the most appropriate contract: a behavior-based contract or an outcome-based contract. However, these authors note that previous study (Wandfluh *et al.*, 2016) was able to demonstrate a connection of agency theory to buyer-supplier relationships in supply chain finance.

According to Dekkers *et al.* (2020), in the supply chain management literature, the theory of transaction cost economics (Williamson, 1979) plays an important role. It presents a general understanding of firms' reasons and behavior for accepting and managing inter-organizational agreements. The theory clarifies why and how companies take their strategic (out) sourcing decisions, define their market entry strategy, develop their buyer-supplier relationships and manage their supply chain risk. Other researchers, such as Williamson (1998), present the four key concepts that underpin transaction cost economics: bounded rationality, asset specificity, potential for opportunism, and alternative modes of governance. In turn, Shou *et al.* (2021) investigate this theory in the field of supply chain finance.

## 2.3 The use of financial instruments to mitigate companies' late payment

Compared to the long-standing problem of LP by companies, the development and use of factoring and RF is relatively recent. However, it has increased in the last years. According the annual review of Factor Chain International (2023), the turnover of factoring and RF in the world has increased around 40% from 2017 to 2022. In 2022, Europe alone has represented 68% of total turnover.

To Klapper (2006), factoring is generally linked to the value of the underlying assets, allowing a quick credit approval and disbursement. Thus, it can be viewed as a preferable solution when firms need to assure their collection process. Besides, it is also used as a tool for cash flow management - by organizing the timing of company's cash flows (Bilgin & Dinc, 2019).

Moreover, some authors argue that the use of factoring increases company's liquidity and also provides a better management of working capital. Therefore, it can mitigate the LP, since companies are in a better financial health to meet their liabilities. However, Salamon *et al.* (2016) claim that LP may happen for different reasons others than company's financial health. Their findings suggest that the organization's ethics also influence payment discipline.

On the other hand, by using a RF transaction, the buyer may be able to negotiate better terms with its suppliers in a collaborative spirit (Klapper, 2006; Van der Vliet *et al.*, 2015). RF is a financing solution for enhance working capital and a tool to mitigate financial stress (Huang *et al.*, 2019; Shou *et al.*, 2021). According to Shou *et al.* (2021), companies can adopt RF to get benefits such as extend cash payments or standardization of payment terms. Thus, by contracting factoring and RF operations, companies should have the financial capacity to make their payments on time. Therefore, it is expected a negative relationship between both FIs and LP.

## 3. METHODOLOGY

This study aims to analyze the existing academic literature on the relationship between the use of both FIs - factoring and RF- to mitigate LP, through a bibliometric analysis and systematic review. There is a natural complementarity between both methodologies. Bibliometric analysis aims to quantify and evaluate scientific production in a given area of study, through the analysis of publication patterns, citation and collaboration between authors, journals and institutions. In turn,

systematic review seeks to identify knowledge gaps and present opportunities for new studies that can produce advances in this area. Thus, the combination of both methodologies allows for a quantitative and qualitative literature review, respectively, on a given topic (Donthu *et al.*, 2021; Mukherjee *et al.*, 2022; Marzi *et al.*, 2024).

The final sample is composed of 16 articles, obtained from January 1<sup>st.</sup>, 2006 to June, 24<sup>th.</sup>, 2023 from the Web of Science (WoS) and Scopus databases. The bibliometric analysis methodology requires the use of specialized software - RStudio, Biblioshiny and Rank Words. Furthermore, the verification of the main bibliometric laws is also adopted - Lotka (1926), Bradford (1934) and Zipf (1949). To carry out both methodologies, 6 steps are implemented. Steps 1 to 4 are related to the bibliometric analysis, while in steps 5 and 6 the systematic review is developed.

Step 1 - Choice of database. The articles are obtained from the following databases: (i) Web of Science (WoS) - belonging to Clarivate Analytics. WoS contains records of scientific articles published in journals with high impact factor, classified by the Journal Citation Reports (JCR) index; and (ii) Scopus - Elsevier's database of academic articles. Scopus measures the relevance of academic journals through the CiteScore index.

Step 2 - Definition of the initial research parameters. To limit the scope of the study, a search is conducted using keywords. Next, filters are applied at WoS and Scopus databases related to language, type of document, area, category and period. However, it is important to mention that Scopus presented few papers. Besides, they also emerged in the research carried out at WoS. Considering this, the research focused on this last database. Due to the dispersion of the theme, it was necessary to consider different combinations of keywords – see Table 1.

Step 3 - Exclusion of articles not related to the defined theme. Once the intermediate sample is defined, the abstract, introduction and conclusion of these articles are read. The final sample is then obtained by excluding those that are not aligned with the main theme of the study. It is worth noting that the final sample of 16 articles was considered by both methodologies. This allowed the quantitative (bibliometric analysis) and qualitative (systematic review) analyses to be carried out on the same sample, complementing the results obtained. Thus, although the number of articles is relatively low for a purely bibliometric analysis, it is more than enough to enable a study capable of indicating an agenda for future research - which is the ultimate aim of a systematic review. The evolution of the final sample is shown in Table 1.

**Table 1 - Evolution of the final sample**

Signal	Description	Number of articles at WoS
(+)	Initial sample obtained by using the keywords "late payment*" or "payment delay*" and "factoring" or "reverse factoring", in the search field of article title, abstract and keyword	276
(+)	Initial sample obtained by using the keywords "factoring" and "leveraged firms" or legal protection of creditors", in the search field of article title, abstract and keyword	15
(+)	Initial sample obtained by using the keywords "reverse factoring" and "accounts receivable period", in the search field of article title, abstract and keyword	1
(=)	<b>Total initial sample</b>	<b>292</b>
(-)	Languages other than "english"	17
(-)	Document types other than "article"	66
(-)	Research areas other than: "business economics" or "engineering" or "operations research management science"	76
(-)	Categories other than: "management" or "economics" or "operations research management science" or "business finance"	27
(=)	<b>Total intermediate sample</b>	<b>106</b>

(-)	Articles which main topic is financial products other than factoring and reverse factoring – e.g.: mortgage, loans, credit card etc	29
(-)	Articles which main topics are not related to this study – e.g.: tax compliance, corporate social responsibility, diferent SCF solutions, criminalization of late payers, government funding, customer characteristics etc	44
(-)	Articles for which it was not possible to obtain the pdf file or to analyze their data by the Rank Words software	17
(=)	<b>Total final sample</b>	<b>16</b>

Step 4 - Bibliometric analysis. The final sample file is imported into the Biblioshiny software, from which the analysis of the objective data of the articles - countries, authors, keywords, institutions, etc. - is carried out. - for the elaboration and analysis of tables and relationship/citation maps. Additionally, the analyses are complemented by the verification of the main bibliometric laws, namely: a) Zipf's Law (1949) - categorizing and estimating the frequency of keywords with the help of the Rank Words software; b) Bradford's Law (1934) - verifying the journals; and c) Lotka's Law (1926) - identifying the researchers with the highest frequency of production on the defined theme.

Step 5 - Reading and coding the articles. Identification of the objectives, samples, methods, contributions and other characteristics of the articles. These are classified and coded in non-exclusive categories and subcategories - see Table 2. This means that the same article can be classified in more than one subcategory, which allows the sum of the frequency of classifications to be greater than 100%.

Step 6 - Systematic review. After coding the (sub)categorization matrix in Table 2 - for the final sample - a frequency count of the subcategories is performed in order to identify knowledge gaps. These gaps are then analyzed, considering the findings of the Bibliometric Analysis and compared with the subcategories of category 10 – Future Avenues, in order to obtain aspects that are subject to further studies on the topic. In Figure 12, the individual subcategories or their combinations - by category - indicate the highest and lowest frequencies of interest about the presented topics.

**Table 2 - (Sub)categorization matrix**

1. Main Topic	A – Factoring	Analysis of the main determinants of factoring operations. These refer to a commercial activity in which the factoring company purchases from the seller company its credit rights arising from contracts for the sale of products to the buying company. Thus, it pays the seller in cash, by charging interest, while the buyer pays it in installments.
	B - Reverse factoring	Analysis of the main determinants of reverse factoring operations. These consist of a commercial activity in which the factoring company pays the suppliers or selling companies in cash, by charging interest. It will be up to the buyer company to pay the factoring company in installments.
	C - Payment discipline	Analysis of how the fulfillment or delay of payments impact the profitability of companies, probability of insolvency, indebtedness etc.
	D - Others	Other subjects not mentioned in 1A to 1C – e.g.: Capital structure; Supply chain finance etc
2. Theories	A - Agency	Companies are made up of a set of contracts. In the ideal contract, there should be an alignment or mitigation of conflict of interests between the principals (owners) and their agents (managers) (Jensen & Meckling, 1976).
	B – Economic transaction costs	Organizations - in an attempt to improve their efficiency - do not focus on production costs only, but also on transaction costs related to the management of interorganizational relationships (Williamson, 1979).
	C - Trade-off	Companies take on debt up to the limit of their tax deduction benefit (Kraus & Litzenberger 1973).
	D - Pecking order	There is an ascending order of fundraising, in terms of costs - operating cash flow, debt, and equity (Myers & Majluf, 1984).

	E - Others	Other theories not mentioned in subcategories 2A to 2D – e.g: Stochastic inventory theory, Price discrimination etc
	F - Not applicable	Not applicable or not mentioned in the text
3. Methods	A – Mathematical models	Study in which a mathematical model is presented as an explanatory tool
	B - Case study	Method that considers the analysis of one or a few specific cases
	C - Regression models	It is based on the development of statistical methods to estimate relationships. They can be used to test economic theories and evaluate government policy implementation and company actions – eg static or dynamic linear regression, logistics, probabilistic, multilevel, structural equations etc.
4. Dependent variables	A - Late payment	The time it takes for countries' companies to pay their late payments
	B - Average late payment time	The excess pay time on the average collection period for countries' companies
	C – Firm leverage	Total short and long terms debt to total asset of the firms
	D – Firm profitability growth	Growth of the firm's profitability
	E - SCF instruments	Trade credit financial products at country or firm level – e.g.: Factoring, RF etc
	F - Others	Other variables not mentioned in 4A to 4C at firm level – e.g.: Operating income return on investment (OIROI)
	G - Not applicable	Not applicable or not mentioned in the text
5. Independent variables	A – Factoring	Existence or not of countries' companies factoring operations
	B - Reverse factoring	Existence or not of countries' companies reverse factoring operations
	C – Other macroeconomic variables	Other variables at country level – e.g.: GDP growth rate, Domestic credit to the private sector etc
	D – Firm variables	Variables at firm level – e.g.: Accounts receivable period, Average days overdue, Lead time etc
	E - Others	Other variables not mentioned in 5A to 5D - e.g.: Clarity, Feasibility, Transparency, Information sharing etc
	F - Not applicable	Not applicable or not mentioned in the text
6. Control variables	A – GDP <i>per capita</i>	Ratio of countries' gross domestic product (GDP) divided for their population
	B – GDP growth rate	Ratio of countries' gross domestic product growth rate – obtained from GDP year “n” less GDP year “n-1” divided per GDP year “n-1”
	C - Domestic credit to the private sector	Ratio of domestic credit - obtained by the private sector - to countries' GDP
	D – Credit information	Credit information index that measures the scope, access and quality of credit information available per country
	E – Enforce debt ratio	Measures the official cost per country of going through court procedures for debt recovery, as a percentage of the debt value
	F - Political stability index	Political stability and absence of violence indexes measure the perceptions of the likelihood that the country government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism
	G – Legal index	Legal index measures the degree to which collateral and bankruptcy laws of a country facilitate creditors lending.
	H – Firm variables	Variables at firm level – e.g.: Size, Age, Leverage etc
	I - Others	Other variables not mentioned in 6A to 6H – e.g.: Inflation, Legal origin of the country etc
	J - Not applicable	Not applicable or not mentioned in the text
7. Data types	A - Financial information	Financial data, obtained from the financial statements of countries' companies - e.g., accounts receivable period
	B - Non-financial information	Data obtained from surveys to countries' companies or market entities - e.g.: Contracting factoring and/or reverse factoring operations, Late payment etc.
	C - Macroeconomic data	Economic indicators that measure a country's aggregate variables - e.g. GDP, Inflation, Exchange rates etc.

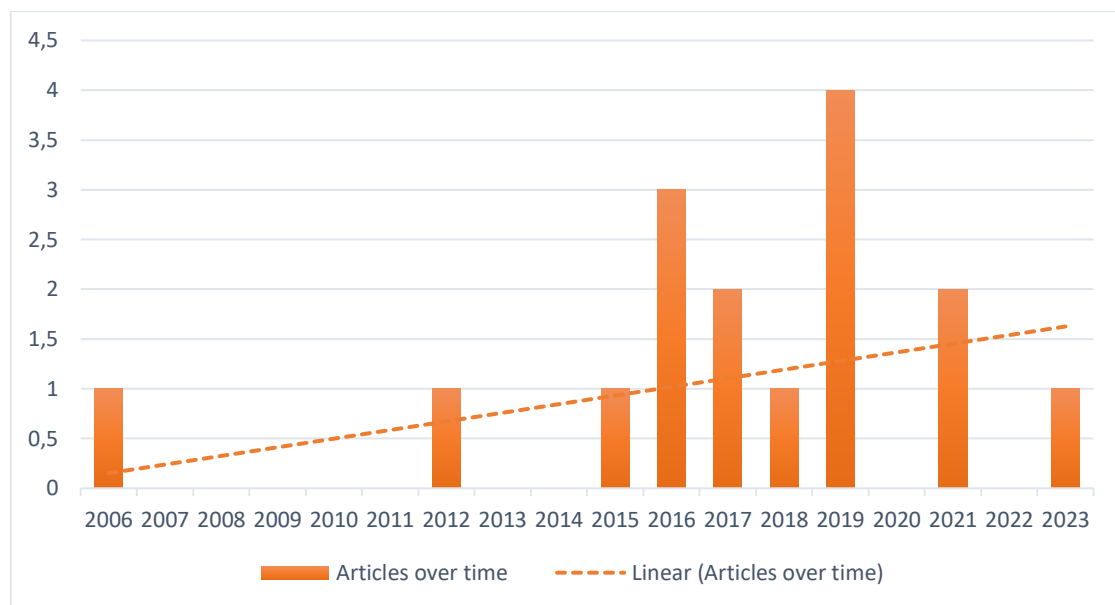
	D - Others	Other types not mentioned in 7A to 7C – e.g: Data obtained through observation, Creation of computational data to perform simulations of mathematical models etc
	E - Not applicable	Not applicable or not mentioned in the text
8. Data source	A - Global	Data from companies covering countries on more than one continent
	B - Europe	Data from companies operating in Europe
	C - Asia/Oceania	Data from companies operating in Asia and Oceania
	D - Not applicable	Not applicable or not mentioned in the text
9. Analysis period	A - Up to 5 years	Duration of the analysis period from 1 to 5 years inclusive
	B - From 6 to 10 years	Duration of the analysis period from 6 to 10 years inclusive
	C - Not applicable	Not applicable or not mentioned in the text
10. Future avenues	A - Emerging markets	Conducting studies in emerging or developing markets
	B - New determinants	Analysis of new determinants to mitigate late payment – e.g: Artificial intelligence, Blockchain technology, Supply chain financing practices etc
	C - Factoring <i>versus</i> bank	Investigation of the relationship between factoring and bank financing products
	D - Apply corporate finance theories to SCF	Apply corporate finance theories to support hypotheses related to SCF - e.g.: Agency theory, Economic transaction costs
	E - Interest rate changes and RF	Analysis of the relationship between changing levels of interest rates and adoption of RF
	F - Others	Other avenues not mentioned in 10A to 10E – e.g.: Impact of countries' governance indicators at firm's late payment, Analysis of SCF use in different scenarios, when both retailer and manufacturer are financially constrained etc
	G - Not applicable	Not applicable or not mentioned in the text

#### 4. RESULTS ANALYSIS

Item 4.1 presents the bibliometric analysis results, mentioned in step 4 of the methodology. In turn, item 4.2 contains the systematic review results, described in steps 5 and 6 of the methodology of this study.

##### 4.1 Bibliometric Analysis

Figure 1 shows the time evolution of the number of articles related to the subject of this research - the relationship between the use of factoring and RF to mitigate LP. The initial year of WoS database is 1945, but the first paper was identified at 2006, only. Figure 1 also shows an intermittent interest about this subject. However, there is an increasing number of published papers from 2015 on, with its peak in 2019.

**Figure 1 - Distribution of articles over time**

Source: Biblioshiny

Table 3 points out the top 10 keywords - defined by the authors - with the highest occurrence in the articles of the final sample. The most frequent terms are trade credit (13.79%), model (8.62%) and adoption (6.89%). As expected, the three most frequent words are related to essential statements of most of the authors in these articles. Trade credit means that both FIs - factoring and RF - are components of SCF and not bank loans. Model is mentioned as an alternative financing model, supposing companies are considering to use them. Adoption, is related to the fact that companies, actually, decided to use both FIs.

**Table 3 - Frequency of the main keywords**

Keywords	Occurrences	%
Trade credit	8	13.79
Model	5	8.62
Adoption	4	6.89
Finance	3	5.17
Framework	3	5.17
Channel	2	3.45
Coordination	2	3.45
Inventory model	2	3.45
Management	2	3.45
Permissible delay	2	3.45

Source: Biblioshiny

These keywords can also be seen at Figure 2 in distinct - but interconnected - clusters. The size of the nodes refers to the number of times the keyword appears in the articles of the final sample. In turn, its color corresponds to the cluster relationship. Thus, the keyword trade credit is more associated with model and adoption ones.

Figure 2 - Co-occurrence map between the main keywords



Source: Biblioshiny

Figure 3 presents - in cloud form - the keywords most used by the authors in the articles of the final sample. The size and centrality of the words indicate their greater frequency. Once again, the keywords trade credit, model, adoption, finance and framework stand out.

Figure 3 - Keywords cloud



Source: Biblioshiny

Still about the keywords, Zipf's Law (1949) analyzes and quantifies the distribution of words in a given text. To do this, it considers the principle that there is a tendency of minimal use of words that have a high frequency of occurrence - see Equation 1:

$$r \times f = C \quad (1)$$

In which:

$r$  = order of the series

$f$  = frequency of occurrence

$C$  = constant

Zipf also proposed a second law for words with low frequency, modified and revised by Booth (1967). For the author, in a given text, several words with low frequency of occurrence have the same assiduity - see Equation 2:

$$I_n = 2I_1 / n (n+1) \quad (2)$$

In which:

$I_1$  = number of words that have frequency 1

$I_n$  = number of words that have frequency n

n = Goffman's point or place of transition from low to high frequency words

Zipf's laws define the extremities of the word distribution list of a given text. Between these extreme points, there is a transition region from high to low frequency words. For Goffman (1971), the existence of a transition point between the highest and lowest frequency words more adequately represents the semantic content of a given text. Pao (1978) presents Goffman's transition point formula - see Equation 3:

$$T = (-1 + \sqrt{1 + 8I_1}) / 2 \quad (3)$$

In which:

T = Goffman's transition point

$I_1$  = number of words that have frequency 1

The identification of Goffman's T-point occurs by decreasing the order of the words in the Rank Words software. After that, those words that repeat only once are identified to calculate Goffman's T-point. Then, the words that are above the rank indicated by this point are located. For the sample of 16 articles, the maximum and minimum frequencies of word repetition vary between 40.32 and 26.30 respectively.

Table 4 presents the top 10 articles in descending order of Goffman's T-point. The transition point of the words ranges from 34.72 to 40.32, with its average being 37.27. For example, the paper of Salamon *et al.* (2016) has 833 words whose repetition frequency is 1. The calculation of equation 3 results in a value of 40.32  $[(-1 + \sqrt{1 + 8 \cdot 833}) / 2]$  of Goffman's T-point. The word that comes closest to this frequency without overcoming it is "financial".

**Table 4 - Goffman's T-point**

No.	Authors	Goffman's T-point
1	Salamon <i>et al.</i> (2016)	40.32
2	Paul <i>et al.</i> (2012)	39.20
3	Vliet <i>et al.</i> (2015)	38.72
4	Goeij <i>et al.</i> (2021)	38.28
5	Jena <i>et al.</i> (2023)	37.24
6	Gelsomino <i>et al.</i> (2019)	36.84
7	Klapper (2006)	36.35
8	Shou <i>et al.</i> (2021)	36.08
9	Lekkakos & Serrano (2016)	34.97
10	Wu <i>et al.</i> (2019)	34.72
<b>Average</b>		<b>37.27</b>

Source: Rank Words

Next, it is performed an analysis of the most frequent words related to the main theme - for each of the 16 articles of the final sample. Rank Words ranks the words in descending order of repetition. Those not relevant to the study are excluded - e.g. (in)defined articles, prepositions, adverbs and pronouns. From the remaining words, those with higher frequency are identified.

Table 5 presents the top 10 articles in descending order of the word with the highest repetition for each study. For instance, Wu *et al.* (2019) cite the word “retailer” 234 times. For these 10 articles, total words with the highest frequency is 1,681. Retailer represents 13.92%  $[(234/1681)*100]$  of this total, and it is the most repeated word in this subsample.

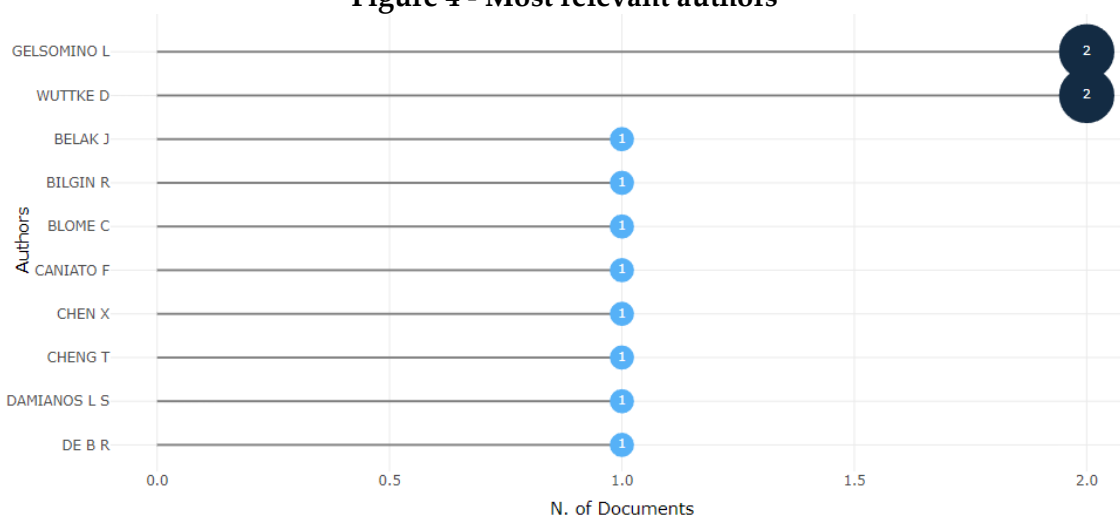
**Table 5 - Zipf's law**

No.	Authors	Word	Quantity	Frequency
1	Wu <i>et al.</i> (2019)	Retailer	234	13.92%
2	Klapper (2006)	Factoring	204	12.14%
3	Shou <i>et al.</i> (2021)	Factoring	200	11.90%
4	Wuttke <i>et al.</i> (2016)	Supply Chain Finance (SCF)	174	10.35%
5	Jena <i>et al.</i> (2023)	Profit	168	9.99%
6	Vliet <i>et al.</i> (2015)	Payment	158	9.40%
7	Bilgin & Dinc (2019)	Factoring	151	8.98%
8	Goeij <i>et al.</i> (2021)	Reverse Factoring Offer (RFO)	143	8.51%
9	Gelsomino <i>et al.</i> (2019)	Supply Chain Finance (SCF)	126	7.50%
10	Obeng (2017)	Payment	123	7.32%
<b>Total</b>			<b>1681</b>	<b>100.00%</b>

Source: Rank Words

Figure 4 presents the most relevant authors. Gelsomino and Wuttke are the ones that wrote at least 2 articles about this research subject, while the other authors present one article, only. Thus, there is a predominance of European researchers on the final sample.

**Figure 4 - Most relevant authors**

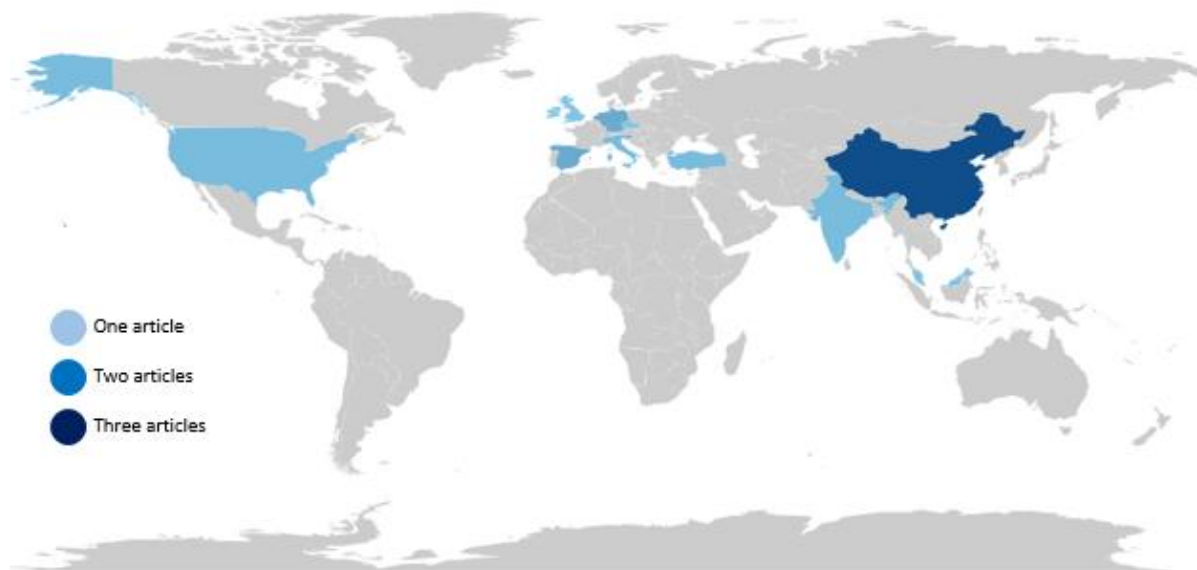


Source: Biblioshiny

As for Figure 5, it shows the countries with scientific production on the world map. Unsurprisingly, given that the top researchers are European, as seen in Figure 4, it is also in European countries that we find the greatest scientific production, despite the relevance of China in particular. Latin America and Africa are not represented by any country. This may be due to the fact that factoring and RF are most widely used in Europe, according the annual review of Factor Chain

International (2023). It may also be due to the interest of European researchers - who are more familiar with these FIs. In other regions of the world, the use of these FIs is low or non-existent.

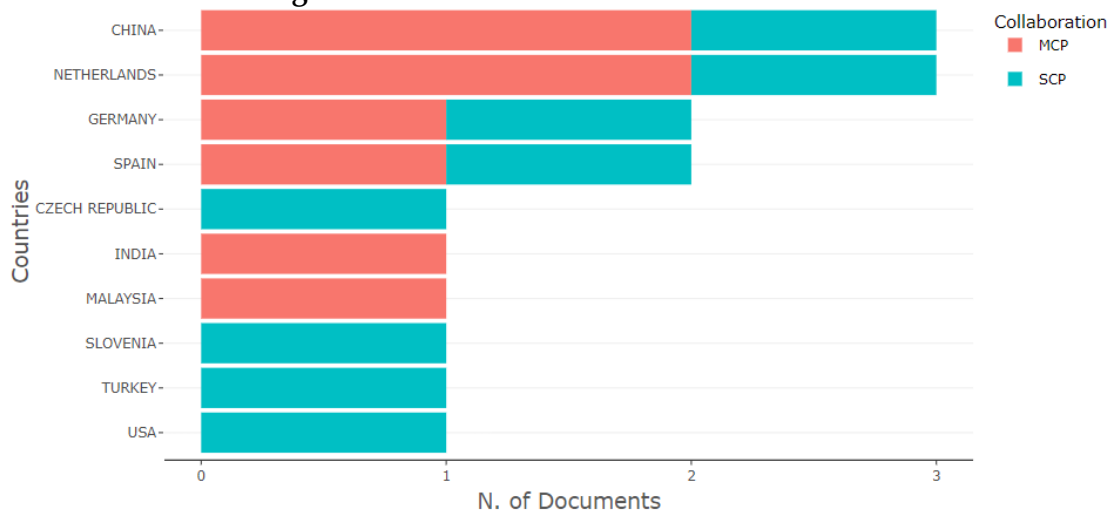
**Figure 5 – Countries' scientific production**



Source: Biblioshiny

Figure 6 highlights the collaboration between authors from different countries in the publication of the articles. Several countries - namely China, the Netherlands, Germany, Spain, India and Malaysia - present articles written in collaboration with authors from other countries - multiple country publications (MCP). The remaining countries have articles written only by local authors - single country publications (SCP).

**Figure 6 – Collaboration between countries**

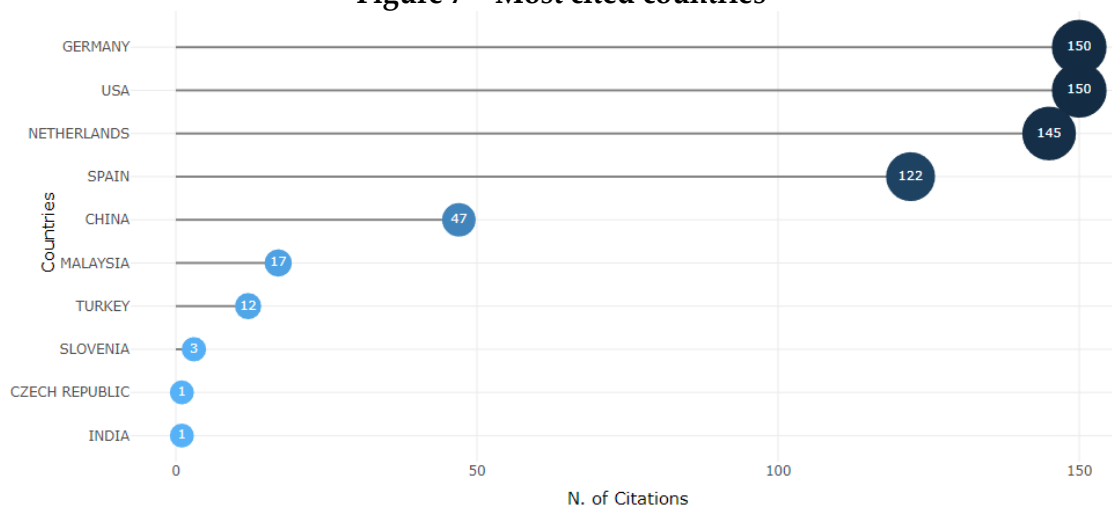


Source: Biblioshiny

Figure 7 shows the total citations of authors affiliated with institutions from a given country. The countries most cited are Germany and the USA - with 150 citations each. In sequence, comes

Netherlands (145), Spain (122) and China (47). Other countries have only 34 citations in total. Once again, we can see the importance of European countries, where three of them (Germany, Netherlands and Spain) account for around 66.66% of the total number of citations.

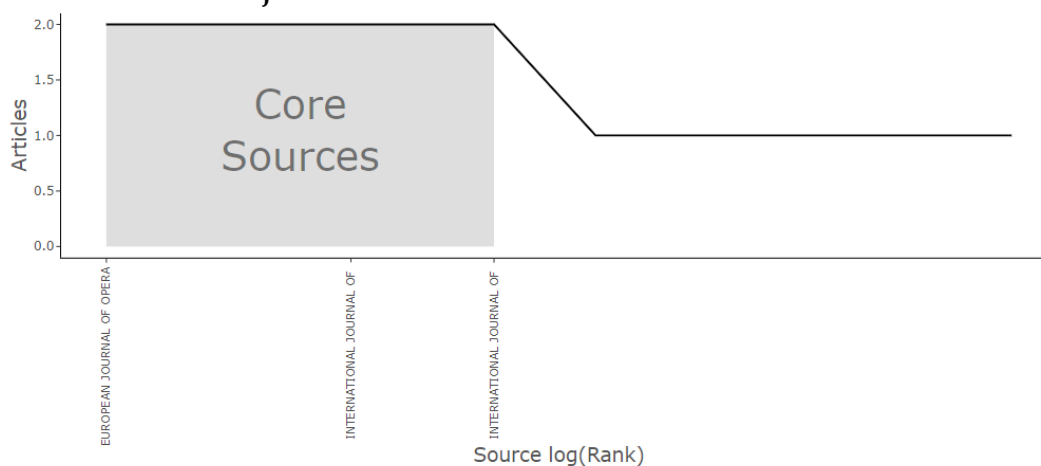
Figure 7 – Most cited countries



Source: Biblioshiny

Regarding Figure 8, it presents the application of Bradford's Law (1934) on journals - there are few journals that produce many articles and many journals that produce few articles on a given topic. Brookes (1969) says that Bradford's Law estimates the degree of relevance of journals in specific areas of knowledge. If journals are ranked in descending order of productivity, they can be distributed into zones ranging in the proportion 1: n: n<sup>2</sup> and so on. These zones are formed by dividing the total number of published articles by three, generally. However, the final sample presents only two zones. The first one shows 2 papers published by the European Journal of Operational Research, International Journal of Production Economics and International Journal of Physical Distribution & Logistics Management. The second zone presents the journals that published 1 paper, only.

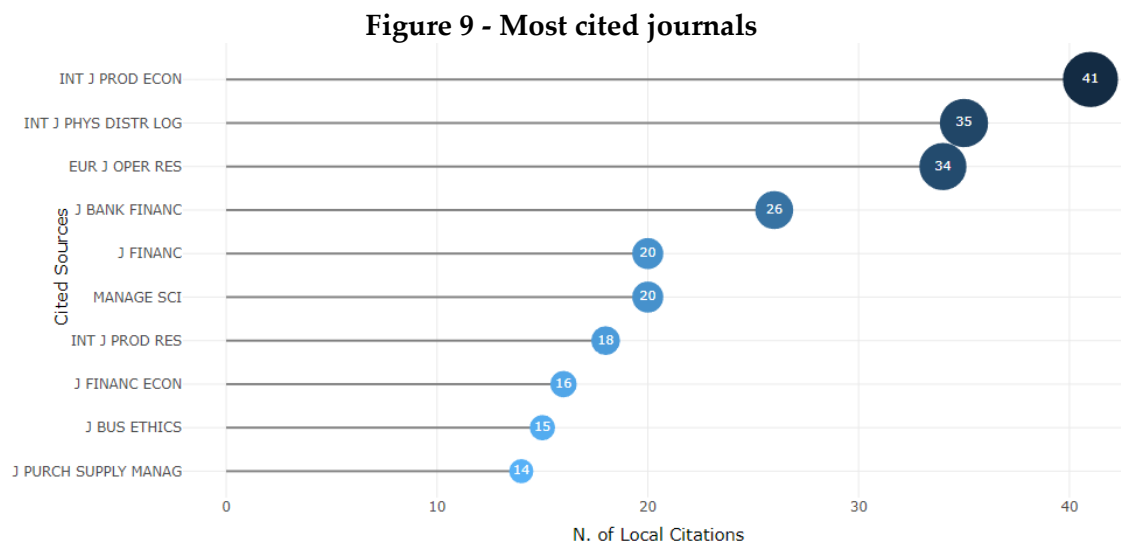
Figure 8 - Bradford's law of journals



Source: Biblioshiny

In turn, Figure 9 presents the total number of citations obtained by a given journal. These citations correspond to the total number of citations that an article has received from other articles indexed in WoS. The journals that stand out are: International Journal of Production Economics, International Journal of Physical Distribution & Logistics Management and European Journal of Operational Research. All of them have more than 30 citations each.

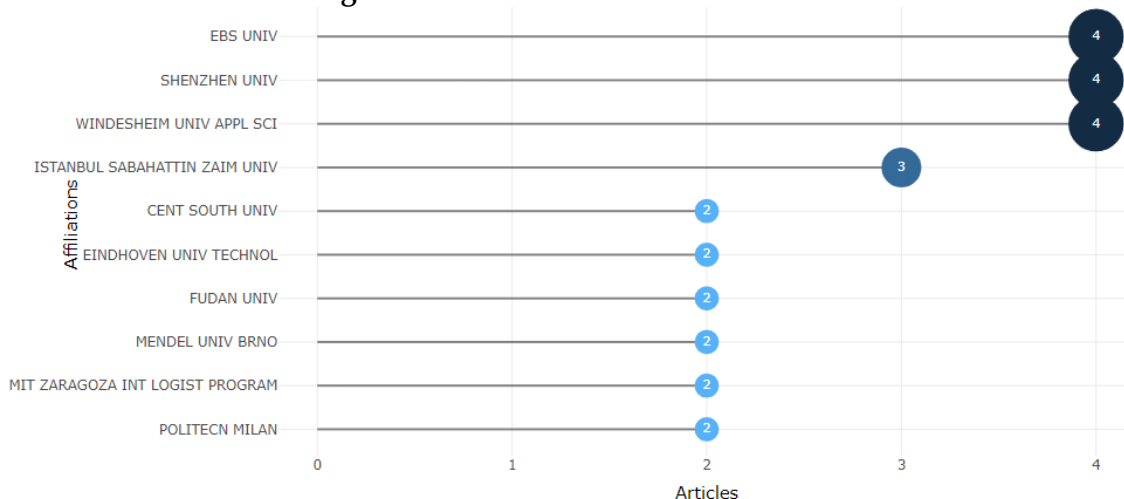
When analyzing the scope of the 3 most cited journals, they refer to supply chain management, production, manufacturing and logistics. This is consistent with what some authors claim, that both FIs - factoring and RF - are components of SCF. Therefore, their use, in addition of having the potential to mitigate LP, can improve the performance of manufacturing companies (Klapper, 2006; Huang *et al.*, 2019; Shou *et al.*, 2021).



Source: Biblioshiny

Figure 10 shows the institutions or affiliations with two or more papers. The institutions that stand out the most are: EBS University in Germany, Shenzhen University in China and also to Windesheim University of Applied Sciences in the Netherlands, each of them with four published papers. In line with the analysis of the previous results, it can be seen that of the three highlighted universities, two of them are European. This emphasizes the relevance of this topic to the European region.

Figure 10 - Most Relevant Affiliations



Source: Biblioshiny

Lotka (1926) states that a small number of authors produce many articles, and that the output obtained by this small number of researchers equals in quantity the performance of the others. This law is called the inverse square law - see Equation 4.

$$a_n = a_1 / n^2, n = 1, 2, 3 \dots \tag{4}$$

In which:

$a_n$  = number of authors who published n articles

$a_1$  = number of authors who published one article

n = number of published articles per author

In Equation 5, Chung and Cox (1990) clarify that the number of authors with a single published article - according to Lotka's Law - would be 60.8%. The number of authors with two published articles should have a frequency of 15.2% (60.8%/2<sup>2</sup>). The number of authors with three published articles would be 6.8% (60.8%/3<sup>2</sup>) - see Equation 5.

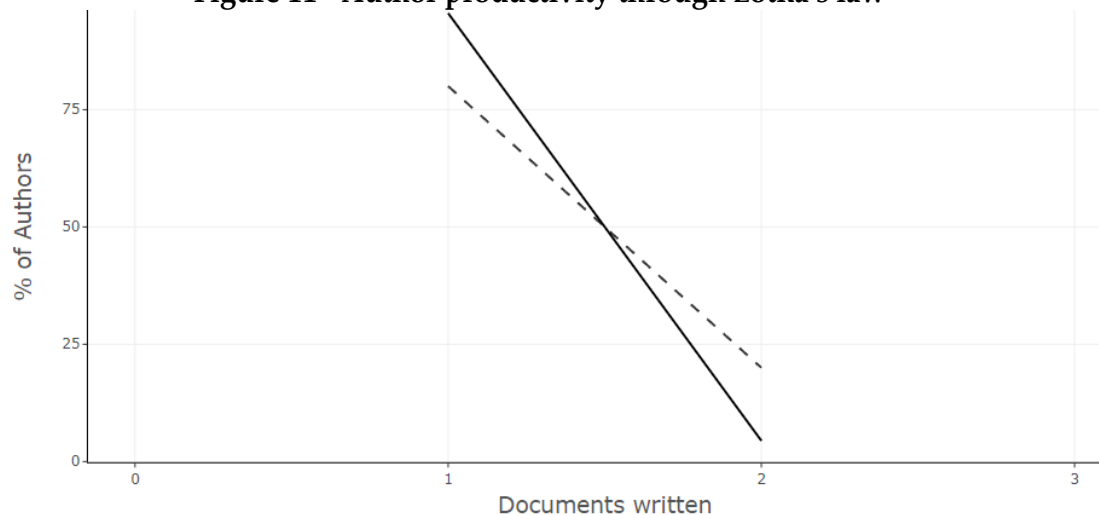
$$a_1 = 6 / \pi^2 = 0,6079 = 60,8\% \tag{5}$$

In which:

$a_1$  = number of authors who published one article

Figure 11 presents the number and percentage of articles published by the authors of the final sample. The standard values of Lotka's Law are presented in the variations of Equation 5. There is a lower percentage of authors publishing a greater number of articles, confirming Lotka's Law. 12.5% (2/16) of the authors in the final sample publish 2 articles. Whereas the remaining 87.5% (14/16) of the authors only produced 1 article, which is a productivity even lower than the standard reference obtained by Lotka (60.8%).

Figure 11 - Author productivity through Lotka's law



Source: Biblioshiny

## 4.2 Systematic Review

The systematic review methodology aims to identify gaps in knowledge related to a particular topic. The purpose of this study is to develop an agenda for future research on the adoption of factoring and RF associated with LP. To this end, Steps 5 and 6 of Methodology clarify that, initially, a (sub) categorization matrix is defined - see Table 2. After reading the 16 articles of the final sample, they are classified and coded into non-exclusive categories and subcategories. Each article can be classified into up to 3 subcategories per category. Subcategories are then counted by frequency. The least frequent combinations of subcategories are those that potentially point to knowledge gaps. Figure 12 summarizes these results at the end of this section.

In category 1, which deals with the main theme of the study, subcategory B - Reverse factoring - is the one with the highest frequency as it is present in 62.5% (10/16) of the articles. This result indicates that the majority of studies seek to analyze the main determinants of reverse factoring operations (Shou *et al.*, 2021). Moreover, subcategory C - Payment discipline - also presents a high frequency with 18.75% (3/16). It includes articles that analyze how the fulfillment or delay of payments impact the profitability of companies (Paul *et al.*, 2012). On the other hand, subcategory A - Factoring - presents the lowest frequency with only 6.3% (1/16). This shows the importance of studying factoring as a viable source of funds to firms, as an alternative to bank and market debts (Klapper, 2006).

As for category 2, which analyzes the theories related to the hypotheses, subcategory F - Not applicable - is the one with the highest frequency of 62.5% (10/16). It means that there is a lack of corporate finance theories that support the hypotheses related to late payment and factoring and RF. This result is in line with that identified in the bibliometric analysis. It was found that the journals that published related topics were more focused on practical issues than theoretical ones (Dekkers *et al.*, 2020).

On the contrary, subcategories A - Agency and B - Economic transaction costs are the ones with the lowest frequency, being 6.3% and 12.5%, respectively. It means that the Agency theory should be better investigated in clarifying the expected relationship between factoring/RF and late payment (Mol-Gómez-Vázquez *et al.*, 2018). As per subcategory C - Trade-off - it is analyzed along with Agency (A) and Pecking order (D) theories. So, it is also a research opportunity to relate these three theories to support the relationship between the mentioned variables (Bilgin & Dinc, 2019).

Category 3, which deals with the research method used in the articles, has in subcategories C - Regression models - and A - Mathematical models its highest representation with 43.8% (7/12) and 31.3% (5/16), respectively. Therefore, there is a greater interest in quantitative methods. In turn, subcategories B - Case study - and the combination of B and C are the least frequent with 6.3% (1/16) each one. Thus, there is an opportunity for the common use of quantitative and qualitative methods (Klapper, 2006).

In category 4, which concerns the dependent variables identified for the articles with regression models, it is noted that there is a dispersion of variables. Subcategory E - SCF instruments - is the one with the highest frequency with 18.75% (3/16). This fact highlights the opportunity to conduct research with the less frequent variables of subcategories A - Late payment - and B - Average late payment time - both with only 6.25% (1/16) each (Obeng, 2017).

As for category 5, which refers to the independent variables of the articles with regression models, the dispersion of variables is also noted here as in the previous category. The subcategories with the highest frequency are C - macroeconomic variables - and D - firm variables - each one with 12.5% (2/16). The categories with less frequency are A - factoring - and B - reverse factoring - both with 6.25% (1/16). Thus, in future researches, authors may consider using an econometric regression as a method (3C). Moreover, they can run a model where the dependent variables may be late payment (4A) or average late payment time (4B), while the independent ones may be factoring (5A) or RF (5B). These relationships have not been thoroughly explored yet (Bilgin & Dinc, 2019; Shou *et al.*, 2021).

Category 6 concerns control variables and here the subcategory with the highest frequency is H - Firm variables - with 25% (4/16). On the other hand, there are some control variables which are analyzed together, such as A, C and E - GDP *per capita*, Domestic credit to private sector and Enforce debt ratio - and D, F and G - Credit information, Political stability index and Legal index. Both combinations have the lowest frequency of 6.3 % (1/16) (Klapper, 2006; Mol-Gómez-Vázquez *et al.*, 2018). Therefore, there is an opportunity for the use of these macroeconomic variables as control ones. The governance and indebtedness level of the markets can clarify the most appropriate use of these financial instruments in each country.

As for category 7, types of analyzed data, the subcategories with the highest frequency of 25% (4/16) each are A - Financial information - and B - Non-financial information - (Bilgin & Dinc, 2019). The use of macroeconomic data (7C) - e.g.: GDP, inflation, exchange rates - for research seems to be a good option since it is the least representative subcategory with only 12.5% (2/16) of the articles in the final sample (Mol-Gómez-Vázquez *et al.*, 2018). This result corroborates the ones presented at the subcategories 6 A, C, E and 6 D, F, G.

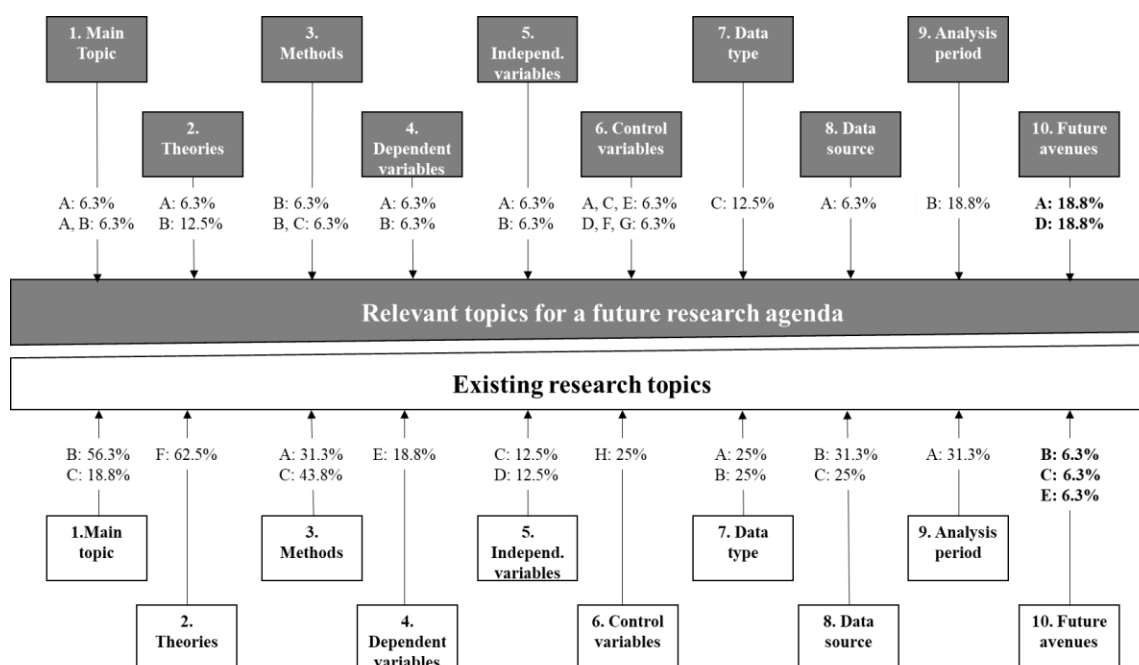
Category 8, which refers to the geographical area on which the study focuses, points that the most frequent subcategory is B - Europe - with 31.25% (5/16) of the articles. It shows that Europe is the continent where this subject has attracted the most attention from researchers (Mol-Gómez-Vázquez *et al.*, 2018). Subcategory C - Asia/Oceania - has also a high frequency of 25% (4/16). The evolution of eastern markets has contributed to their alignment with European developed countries, in terms of the use of financial products. Regarding the subcategory A - Global - it is the least representative one with only 6.25% (1/16).

The results of studies by European and Asian researchers show similarities regarding the use of both FIs. For companies to use factoring and RF, it is convenient to have good information technology and information sharing between stakeholders (Van der Vliet *et al.*, 2015; Bilgin & Dinc, 2019; Huang *et al.*, 2019; Shou *et al.*, 2021). However, the question remains whether these results would be similar or divergent if the studies were carried out in other regions not researched. Thus, investigate globally or even in regions such as Latin America - not represented in the final sample - seems to be an avenue to explore.

Regarding category 9, it refers to the analyzed period of the studies. The period with the highest frequency is subcategory A - up to 5 years - with 31.3% (5/16) and the subcategory with the least frequency is B – from 6 to 10 years – with 18.8% (3/16). In future researches, it would be interesting to conduct a study with longer periods of time such as 10 or more years. The analysis of financial instruments for mitigating late payment demands a longer time, in order to verify its effectiveness in different economic scenarios (Obeng, 2017).

Finally, category 10 refers to the identification of futures avenues of academic research. Authors – of the final sample – show that some topics should be better explored. The most represented subcategories are A – Emerging markets – and D - Apply corporate finance theories to SCF – both with 18.8% (3/16). These results are in line with subcategories 8A and 2F. Besides, other topics that also arouse a minor academic interest are the analysis of B – New determinants to mitigate late payments, C – The investigation of the relationship between factoring and bank financing products and E – The relationship between changing levels of interest rates and adoption of RF. All of them presented a frequency of 6.3% (1/16). Thus, it seems to be a good opportunity to conduct future research in emerging markets such as Latin America and relate corporate finance theories to SCF (Paul *et al.*, 2012; De Goeij *et al.*, 2021).

**Figure 12 - Suggestions for a future research agenda**



Note: The subcategories at the top are those with less frequency, being subject to future analysis by researchers – with the exception of **category 10 – Future avenues**. In this case, the most frequent subcategories are those that suggest avenues for a future agenda.

### 5. CONCLUSION

This paper aims to identify the literature about the impact of factoring and RF financial instruments on firm’s late payment. In order to do this, a bibliometric analysis and systematic review were carried out. The literature identified that there is a relationship between both themes. Klapper (2006), Lekakos and Serrano (2016) and Shou *et al.* (2021) state that the use of factoring and RF allows companies to increase their working capital, profitability and efficiency. Thus, the improvement of the financial and operational performance facilitates their payments on time and mitigates their delays.

The results obtained by the bibliometric analysis answered research questions (a) to (d). About the question (a) What is the evolution of academic production on this topic?, there is an increasing number of published studies from 2015 on, with its peak in 2019. Concerning question (b) What are the patterns of collaboration between the main authors, institutions and countries in the analyzed sample?, the results show that Luca Mattia Gelsomino and David Wuttke are the most relevant authors in terms of number of published articles. Both of them wrote two papers.

The Lotka's law is also confirmed. There is a lower percentage of authors publishing a greater number of articles. The institutions - to which the authors are linked - are located in China (Shenzhen University), Netherland (Windesheim University of Applied Sciences) and Germany (EBS University), mostly. They produce papers also in collaboration with authors from other countries. These results show a predominance of European researchers and universities dedicated to studying this topic.

With respect to question (c) What are the articles, authors and journals that have the greatest impact on the topic of this research?, the most cited articles are linked to institutions located in Germany, United States, Netherland and Spain. This is due to the specificity of authors and journals to this research topic, such as European Journal of Operational Research, International Journal of Production Economics and International Journal of Physical Distribution & Logistics Management. Bradford's law was also confirmed, these three journals published two papers about the research topic each one.

Leora Klapper stands out as the most cited author with her seminal study from 2006, entitled "The role of factoring for financing small and medium enterprises". This is one of the first papers to address factoring and RF as FIs and that it can be used by companies to improve their financial situation.

In response to the question (d) What are the main connections between the sample documents?, the results indicate that most studies are about European companies. This finding points to the need to conduct studies in other geographic regions, such as Latin America, for example. In fact, Latin American countries were not included in the final sample of this study. Another finding concerns the journals in which the articles were published. Those dedicated to investigating supply chain management, production, operations and performance stand out - in a more practical than theoretical aspect. This is aligned with the fact that both FIs – factoring and RF – are components of SCF.

On the other hand, the systematic literature review answered the last question (e) What are the knowledge gaps related to the use of factoring and reverse factoring in mitigating companies' late payment?. In addition to identifying gaps, it allows to outline an agenda for future research. Thus, the articles were classified into categories and subcategories. Each article has up to three subcategory classifications for each category. Table 2 presents a description of the (sub)categorization matrix.

Figure 12 summarizes its analysis, highlighting the most and least frequent subcategories. It shows the possibility of a future research agenda that includes: i) the analysis of the impact of factoring/RF on firm's late payment, ii) the use of corporate finance theories that support the hypotheses related to factoring/RF and late payment, iii) the combination of qualitative and quantitative methods, iv) the use of macroeconomic control variables, v) investigation of Latin America firms, vi) extension of the data analysis period.

This study contributes to academia by outlining the key features of papers, authors, and journals, as well as the trends of cooperation amongst studies on this subject. Furthermore, it highlights potential knowledge gaps – such as theories, methodological approaches, etc. – that could affect the outcomes of this relationship. Finding the FI and macroeconomic control proxies that best explain the link with corporate LP is one way that firms, investors, and other stakeholders might profit from

this study results. Lastly, they can help governments and regulators to develop micro (macro)economic policies that better fit to LP mitigation. Overall, the results support the creation of financial solutions that better meet the demands of companies and economies.

This paper differs from others because – to the best of our knowledge – this is one of the first to analyze the relationship between factoring/RF and LP through a bibliometric analysis and systematic review. Its originality consists in presenting a (sub) categorization matrix that points out specific aspects, such as corporate finance theories, (in) dependent and control variables, research methods and data origin. Finally, the main limitation of this study is the small final sample size. This is due to the fact that there is little research on this topic.

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## CONFLICT OF INTERESTS

The authors declare no conflict of interests.

## REFERENCES

- Adaku, E., Osei-Poku, V., Ottou, J.A., & Yirenkyi-Fianko, A. (2023). Contractor payment delays: A systematic review of current trends and future directions. *Construction Innovation. Ahead of print*. 1471-4175. <https://doi.org/10.1108/CI-12-2022-0317>
- Bilgin, R., & Dinc, Y. (2019). Factoring as a determinant of capital structure for large firms: Theoretical and empirical analysis. *Borsa Istanbul Review*, 19(3), 273-281. <https://doi.org/10.1016/j.bir.2019.05.001>
- Booth, A. D. (1967). A “law” of occurrences for words of low frequency. *Information and Control*, 10(4), 386-393. [https://doi.org/10.1016/S0019-9958\(67\)90201-X](https://doi.org/10.1016/S0019-9958(67)90201-X)
- Bradford, S.C. (1934). Sources of information on scientific subjects. *Engineering: An Illustrated Weekly Journal*, 137, 85-86. <https://doi.org/10.1177/016555158501000407>
- Brookes, B.C. (1969). Bradford’s law and the bibliography of science. *Nature*, 224, 953- 956. <https://doi.org/10.1038/224953a0>
- Caniato, F., Henke, M., & Zsidisin, G.A. (2019). Supply chain finance: Historical foundations, current research, future developments. *Journal of Purchasing and Supply Management*, 25(2), 99-104. <https://doi.org/10.1016/j.pursup.2019.02.002>
- Chakuu, S., Masi, D., & Godsell, J. (2019). Exploring the relationship between mechanisms, actors and instruments in supply chain finance: A systematic literature review. *International Journal of Production Economics*, 216, 35-53. <https://doi.org/10.1016/j.ijpe.2019.04.013>
- Checherita-Westphal, C., Klemm, A., & Viefers, P. (2016). Governments’ payment discipline: The macroeconomic impact of public payment delays and arrears. *Journal of Macroeconomics*, 47, 147-165. <https://doi.org/10.1016/j.jmacro.2015.12.003>
- Chung, K.H., & Cox, R.A. (1990). Patterns of productivity in the finance literature: A study of the bibliometric distributions. *Journal of Finance*, 45(1), 301-309. <https://doi.org/10.1111/j.1540-6261.1990.tb05095.x>
- De Goeij, C., Gelsomino, L.M., Caniato, F., Moretto, A.M., & Steeman, M. (2021). Understanding SME suppliers' response to supply chain finance: A transaction cost economics perspective. *International Journal of Physical Distribution & Logistics Management*, 51(8), 813-836. <https://doi.org/10.1108/IJPDLM-04-2020-0125>
- Dekkers, R., de Boer, R., Gelsomino, L.M., de Goeij, C., Steeman, M., Zhou, Q., Sinclair, S., & Souter, V. (2020). Evaluating theoretical conceptualisations for supply chain and finance integration: a Scottish focus group. *International Journal of Production Economics*, 220, 107451. <https://doi.org/10.1016/j.ijpe.2019.07.024>

- Gaier, R.V., & Bautzer, T. (2023). *Brazil's Americanas could face up to \$8 billion early debt charges after accounting scandal, court warns*. Reuters. Retrieved from <https://www.reuters.com/business/retail-consumer/minority-shareholders-denounce-brazils-americanas-multi-billion-fraud-2023-01-13/>
- Gelsomino, L.M., de Boer, R., Steeman, M., & Perego, A. (2019). An optimisation strategy for concurrent supply chain finance schemes. *Journal of Purchasing and Supply Management*, 25(2), 185-196. <https://doi.org/10.1016/j.pursup.2018.07.004>
- Goffman, W. (1971). A mathematical method for analyzing the growth of a scientific discipline. *Journal of the Association for Computing Machinery*, 18(2), 173-185. <https://doi.org/10.1145/321637.321640>
- Grüter, R., & Wuttke, D.A. (2017). Option matters: Valuing reverse factoring. *International Journal of Production Research*, 55(22), 6608-6623. <https://doi.org/10.1080/00207543.2017.1330564>
- Huang, Q., Zhao, X., Zhang, M., Yeung, K., Ma, L., & Yeung, J.H.Y. (2019). The joint effects of lead time, information sharing, and the accounts receivable period on reverse factoring. *Industrial Management & Data Systems*, 120(1), 215-230. <https://doi.org/10.1108/IMDS-04-2019-0228>
- Jena, S.K., Padhi, S.S., & Cheng, T.C.E. (2023). Optimal selection of supply chain financing programmes for a financially distressed manufacturer. *European Journal of Operational Research*, 306(1), 457-477. <https://doi.org/10.1016/j.ejor.2022.07.032>
- Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Kapner, S., & Biswas, S. (2023). *Bed Bath & Beyond files for bankruptcy*. The Wall Street Journal. Retrieved from <https://www.wsj.com/articles/bed-bath-beyond-files-for-bankruptcy-cc7e8b40>
- Kegali, G. (2022). *Disclosure of supplier finance arrangements: Proposals focus on disclosures only*. KPMG. Retrieved from <https://kpmg.com/xx/en/home/insights/2021/12/supplier-finance-arrangements-exposure-draft-ias7-ifrs7.html>
- Klapper, L. (2006). The role of factoring for financing small and medium enterprises. *Journal of Banking & Finance*, 30(11), 3111-3130. <https://doi.org/10.1016/j.jbankfin.2006.05.001>
- Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*, 28(4), 911-922. <https://doi.org/10.2307/2978343>
- Lekakos, S.D., & Serrano, A. (2016). Supply chain finance for small and medium sized enterprises: the case of reverse factoring. *International Journal of Physical Distribution & Logistics Management*, 46(4). <https://doi.org/10.1108/IJPDLM-07-2014-0165>
- Lotka, A.J. (1926). The frequency distribution of scientific productivity. *Journal of the Washington Academy of Sciences*, 16, 317-323. <https://www.jstor.org/stable/24529203>
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)
- Mol-Gómez-Vázquez, A., Hernández-Cánovas, G., & Koëter-Kant, J. (2018). Legal and Institutional Determinants of Factoring in SMEs: Empirical Analysis across 25 European Countries. *Journal of Small Business Management*, 56(2), 312-329. <https://doi.org/10.1111/jsbm.12260>
- Obeng, I.K.E. (2017). Delaying payments in the European union: An empirical dynamic panel data analysis. *Ekonomicky Casopis*, 65(10), 952-971. <https://www.sav.sk/journals/uploads/1204145310%2017%20Obeng%20+%20RS.pdf>
- Official Journal of the European Union (2011). *Directive no. 2011/7/EU of the European Parliament and of the Council*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0007&from=PT>
- Pao, M.L. (1978). Automatic text analysis based on transition phenomena of word occurrences. *Journal of the American Society for Information Science*, 29(3), 121-124. <https://doi.org/10.1002/asi.4630290303>

- Paul, S.Y., Devi, S.S., & Teh, C.G. (2012). Impact of late payment on firms' profitability: Empirical evidence from Malaysia. *Pacific-Basin Finance Journal*, 20(5), 777-792. <https://doi.org/10.1016/j.pacfin.2012.03.004>
- Salamon, T., Milfelner, B., & Belak, J. (2016). Late payments explained by ethical culture. *Journal of East European Management Studies*, 21(4), 458-488. <https://www.jstor.org/stable/44111960>
- Shou, Y., Shao, J., & Wang, W. (2021). How does reverse factoring affect operating performance? An event study of Chinese manufacturing firms. *International Journal of Operations & Production Management*, 41(4), 289-312. <https://doi.org/10.1108/IJOPM-07-2020-0469>
- Van der Vliet, K., Reindorp, M. J., & Fransoo, J. C. (2015). The price of reverse factoring: Financing rates vs. payment delays. *European Journal of Operational Research*, 242, 842-853. <https://doi.org/10.1016/j.ejor.2014.10.052>
- Wandfluh, M., Hofmann, E., & Schoensleben, P. (2016). Financing buyer-supplier dyads: an empirical analysis on financial collaboration in the supply chain. *International Journal of Logistics Research and Applications*, 19(3), 200-217. <https://doi.org/10.1080/13675567.2015.1065803>
- Williamson, O.E., (1979). Transaction-cost economics: the governance of contractual relations. *Journal of Law and Economics*, 22(2), 233-261. <https://doi.org/10.1086/466942>
- Williamson, O.E., (1998). Transaction cost economics: how it works; where it is headed. *Economist*, 146(1), 23-58. <https://doi.org/10.1023/A:1003263908567>
- Wu, Y., Wang, Y., Xu, X., & Chen, X. (2019). Collect payment early, late, or through a third party's reverse factoring in a supply chain. *International Journal of Production Economics*, 218, 245-259. <https://doi.org/10.1016/j.ijpe.2019.04.040>
- Wuttke, D.A., Blome, C., Heese, H.S., & Protopappa-Sieke, M. (2016). Supply chain finance: Optimal introduction and adoption decisions. *International Journal of Production Economics*, 178, 72-81. <https://doi.org/10.1016/j.ijpe.2016.05.003>
- Zainudin, N. (2008). Tracking the credit collection period of Malaysian small and medium-sized enterprises. *International Business Research*, 1(1), 78-86. <https://www.ccsenet.org/journal/index.php/ibr/article/view/1019>
- Zipf, G.K. (1949). *Human behavior and the principle of least effort: an introduction to human ecology*. Cambridge, MA: Addison-Wesley Press.