

Journal of Management Sciences

Rethinking Outsourcing: Balancing Competitive Advantage and Industry Interdependence

Affiliation:

Arbia Chatmi
YSchools, SCBS, South Champagne Business School
Email: arbia.chatmi@yschools.fr

Karim Elasri
Kedge Business School, Aix- Marseille Université,
CERGAM, France
Email: karim.elasri@gmail.com

Bernard Guilhon
SKEMA Business School, France
Email: bernard.guilhon@skema.edu



Manuscript Information

Submission Date: February 15, 2025

Reviews Completed: June 26, 2025

Acceptance Date: June 26, 2025

Publication Date: July 16, 2025

Citation in APA Style:

Chatmi, A., Elasri, K., & Guilhon, B. (2025). Rethinking Outsourcing: Balancing Competitive Advantage and Industry Interdependence, *Journal of Management Sciences*, 12 (1), 1-27.



Rethinking Outsourcing: Balancing Competitive Advantage and Industry Interdependence

Arabi Chatmi^{1,2}, Karim Elasri^{3,4*}, Bernard Guilhon⁵

Abstract: Companies are reassessing outsourcing strategies in response to heightened competition, including COVID-19 impact. They are seeking ways to optimize competitive advantage through outsourcing while addressing concerns about dependence on suppliers. Our research reveals that industries that utilize outsourcing often do so to enhance their productivity levels, tapping into the productivity of supplier industries. The outsourcing rate plays a critical role in the client industry's capacity to focus on its core and essential activities and shield them from the influence of the supplier industry. In scenarios of low outsourcing rates, client industries typically engage in outsourcing when faced with low competition, resulting in a situation of low interdependence and the potential for client industry dominance. Conversely, in instances of high outsourcing rates, client industries are compelled to outsource amid intense competition, leading to a medium level of interdependence and the possibility of supplier industry dominance. Furthermore, regardless of the extent of outsourcing, client industries tend to prefer supplier industries that are less innovative. This preference helps them maintain their competitive advantage and reduces their dependence on highly innovative suppliers.

Keywords: Experiential Outsourcing, Competitive Advantage, dependence, Innovation, and Industry.

Introduction

The benefits of outsourcing are numerous, including cost reduction (Chalos & Sung, 1998) by converting fixed costs into variable costs (Lonsdale & Cox, 2000), resource allocation to core activities (Lonsdale & Cox, 2000), and improved customer service (Narasimhan & Talluri, 2009). Indeed, outsourcing has enabled many firms to achieve higher profitability (Broedner et al., 2009). This phenomenon has impacted various activities, ranging from IT and business process services to manufacturing, logistics, product development, market intelligence, healthcare, and more (Liu et al., 2022; Bertschek et al., 2017; Mahnke et al., 2005; Roberts, 2001; Ram et al., 2010; Rapp, 2009). Additionally, industries such as business aviation experience phases of growth, contraction, and consolidation, necessitating strategic navigation to maintain competitiveness (Jacobs & Goebels, 2020).

¹ YSchool, SCBS, South Champagne Business School

² LR ECSTRA, IHEC Carthage Présidence, France

³ Kedge Business School

⁴ Aix- Marseille Université, CERGAM, France

⁵ SKEMA Business School, France

In our study, outsourcing is defined as the purchase of manufactured physical inputs or services from an external provider, outside the firm's boundaries (Manning et al., 2008) and is limited to intermediate goods (products or services) procurement from external providers (Bhagwati et al., 2004). The decision to outsource or produce internally (Edvardsson et al., 2011; Miyamoto, 2021), i.e., buy or make intermediate goods, determines the firm's boundaries (Rodríguez & Robaina, 2006; Lambertini, 2010; Sen et al., 2020).

The drivers of outsourcing have been extensively studied to understand which activities should be outsourced (Grossman & Helpman, 2002; Jacobides & Winter, 2005; McIvor, 2008) and under what conditions to mitigate risks (Verwaal et al., 2009; Lungescu et al., 2011; Wayman, 2013; Li et al., 2017; Zhou et al., 2023). According to some authors (Pfeffer & Salancik, 1978; Garavan, 2012; Hofer et al., 2021), industry characteristics can influence the flow of inputs. Moreover, technological advancements and supply chain dynamics have been identified as key drivers of the strong performance observed in the manufacturing sector (Vitner & Iqbal, 2019).

As industries engage in a dynamic interplay of competition and innovation, the structure of the value chain undergoes continuous reshaping. Despite this ongoing evolution, existing literature fails to adequately address how industries strategically position themselves within outsourcing relationships to bolster their competitive advantage and mitigate the risk of dependence on external partners.

Indeed, the experience in outsourcing is reflected in the decision to outsource at the industry level (Pfeffer & Salancik, 1978; Qu et al., 2011; Hofer et al., 2021). In light of this, how do industries assess and refine their outsourcing approaches to optimize competitive advantage while managing dependence on suppliers? Thus, our study aims to investigate how French industries strategically leverage outsourcing to enhance their competitive advantage and manage their dependence.

The Resource-Based View (RBV) perspective argues that outsourcing enables firms to leverage the competencies of suppliers in certain activities (Tokman et al., 2012), while allowing the client firm to concentrate on its core competencies to develop a competitive advantage and improve overall efficiency (Wernerfelt, 1984; Barney, 1991). Industry characteristics also reflect firms' decisions to retain their core competencies in-house (Baatartogtokh et al., 2018; Sen et al., 2020; Alrwashdeh et al., 2022), as firms recognize the importance of these core competencies in contributing to their competitive advantage. Therefore, clear identification and definition of core competencies is crucial to effectively benefit from outsourcing opportunities.

The issue of dependence, or power, is central in supply chain management research (Tangpong et al., 2008; Zhao et al., 2008; Jean et al., 2012), with studies focusing on both small and medium-sized enterprises (SMEs) (Gandia & Brion, 2016) and large companies (Davis & Cobb, 2010) and exploring tactics for managing dependence (Casciaro & Piskorski, 2005). Qu et al. (2011) have identified industry characteristics that impact the use of IT outsourcing, while others have highlighted the significance of environmental uncertainty in the industry (Hofer et al., 2021). The Resource-Dependence Theory (RDT) approach considers the interdependencies between client and supplier relationships, and how they can influence outsourcing decisions based on power dynamics.

In this study, we draw upon the RBV and the RDT to analyze industry-level behavior. While RBV primarily focuses on the competitive advantage of client firms rather than supplier firms (Baraldi et al., 2014), our study takes into account the competitive advantage developed by companies in both the client and supplier industries. We aim to

examine whether the competitive advantage in the supplier industry influences the decision to outsource. On the other hand, previous studies employing the RDT approach have predominantly used questionnaires to investigate how relationships evolve based on the dependence of clients and suppliers (Chaurasia, 2014; Liu et al., 2013; Gandia & Brion, 2016; Touboul et al., 2014), often represented using power maps (Cox, 2004; Caniels & Gelderman, 2005; Caniels & Roeleveld, 2009; Hansen & Rasmussen, 2013; Strange, 2011). Our quantitative study aims to demonstrate which interdependencies between clients and suppliers are associated with higher levels of outsourcing.

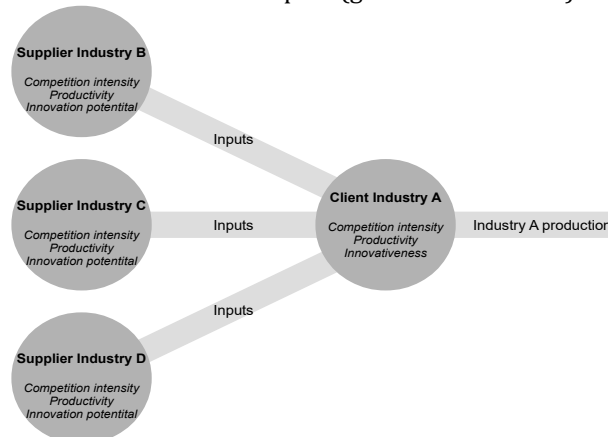
This study analyzes industries in France, encompassing goods and services sectors with varied knowledge intensity. Outsourcing decisions hinge on industry characteristics like competition and productivity (Figure 1), aiding French industries in maintaining competitive advantage and minimizing dependence.

First, the outsourcing decisions of client industries are intricately influenced by the dynamic landscape they operate within, encompassing factors such as productivity levels and the intensity of competition. Rooted in theories like the Resource-Based View (RBV) and Resource Dependence Theory (RDT), these decisions often stem from a need to concentrate on core activities, leading to a higher likelihood of outsourcing. Additionally, when client industries exhibit lower to medium levels of dependence, outsourcing tendencies are further accentuated.

Second, the attractiveness of the supplier industry, gauged by its productivity and but not its competitiveness, plays a pivotal role in shaping outsourcing dynamics. From an RBV standpoint, supplier industries endeavor to uphold their competitive advantage by drawing more activities through outsourcing arrangements. However, the supplier industry is also adept at capitalizing on the pressures faced by client industries, be it in terms of competition intensity or existing outsourcing rates. Consequently, supplier industries may exercise selectivity in their outsourcing decisions, leveraging their advantageous position in the interdependent relationship between the two sectors as posited by RDT.

Third, disparities in innovation levels between client and supplier industries significantly influence the outsourcing process. Peripheral and less innovative activities are often outsourced, allowing clients to channel their focus towards core functions while mitigating the risk of suppliers evolving into competitors.

Figure 1: The inter-industrial flow of inputs (goods and services) between industries



The remainder of the article is organized as follows. The second section briefly

summarizes prior work on the importance of outsourcing to stay competitive and the risks associated with outsourcing explaining our choice to analyze industry characteristics of suppliers and clients: competition intensity, productivity and innovation potential. The third section develops our empirical approach. The fourth section presents empirical results on the favorable industry characteristics of suppliers and clients for purchase of inputs. The fifth section discusses the results and the implications and presents limitations and future development. The last section presents the conclusions.

Literature Review

Growth of outsourcing: Favorable industry characteristics

The concept of outsourcing involves two key aspects: identifying activities to outsource and successfully implementing outsourcing initiatives (Lacity et al., 2010). Focusing solely on short-term cost savings is insufficient, as firms need to consider the long-term implications related to quality and skills (Prasad & Prasad, 2007). As such, it is crucial to view outsourcing as an ongoing organizational “activity” that requires management and refinement, rather than a one-time opportunistic “act” (Pratap, 2014). This perspective underscores the importance of flexible outsourcing, which allows for the possibility of reverting to vertical integration after outsourcing, as advocated by some authors (Moretto & Rossini, 2011).

Indeed, the motivation for outsourcing is often driven by the desire to achieve cost reduction, enhanced effectiveness, increased competitiveness, and improved performance, particularly by focusing on core competencies, as highlighted in many studies (Gao & Gong, 2022; Valiyattoor & Bhandari, 2020; Grimpe & Kaiser, 2010). However, despite this enthusiasm, outsourcing can also present challenges and yield disappointing results (Robinson et al., 2008; Grimpe & Kaiser, 2010; Weigelt, 2009), which can dampen the initial enthusiasm.

Nevertheless, outsourcing has expanded beyond traditional manufacturing and peripheral functions (Kloyer et al., 2019) to encompass strategic and risky activities, such as R&D activities, as evidenced by studies (Hoecht & Trott, 2006; Quélin & Duhamel, 2003; Carboni, 2012; Guilhon, 2012; Ceccagnoli et al., 2014; Becker & Zirpoli, 2017; Yamaguchi et al., 2021; García-Vega & Huergo, 2021). This trend raises further concerns about dependence (Kloyer et al., 2019).

The Competitive Advantage

In spite of the challenges associated with outsourcing, firms continue to engage in this practice due to the intensity of competition (Grossman & Helpman, 2002), particularly in peripheral services. Firms need to keep internal those activities for which they possess resources that can yield a competitive advantage, especially when facing high levels of competition. In order to remain competitive, firms must develop a portfolio of competencies (Wernerfelt, 1984) that enable them “to coordinate diverse production skills and integrate multiple streams of technology” (Prahalad & Hamel, 1990). Therefore, the driving force behind outsourcing is the competition intensity that firms face (Garvey & Pitchford, 1995).

Client industries enhance their productivity and specialization by developing core competencies in-house, while outsourcing other non-core competencies (Quinn &

Hilmer, 1994). The higher the productivity of these client industries, the more they need to be effective and efficient. Indeed, productivity plays a central role in sustaining the overall dynamism of firms within industries (Foste & He, 2022). Domestic and foreign outsourcing (Bernasconi et al., 2022) becomes a means of achieving effectiveness and efficiency (Bental et al., 2012; Vermeulen et al., 2018). By outsourcing certain activities, firms can focus on activities that align with their core competencies (Prahalad and Hamel, 1990; Quinn & Hilmer, 1994) or activities that generate strategic value (Barney, 1991). Outsourcing allows firms to free up resources for the development of core competencies (Boguslauskas & Kvedaraviciene, 2009; Quinn & Hilmer, 1994), even though they may need to continue investing in related operational capabilities to retain the benefits of outsourcing (Bengtsson & Dabhikar, 2009). It is evident that maintaining a high level of productivity and the need to sustain it necessitate continued outsourcing.

The resource-based view (RBV) perspective underscores the contribution of resources to achieving a sustained competitive advantage (Dierickx & Cool, 1989; Barney, 1991). As such, activities that do not significantly contribute to a competitive advantage should be outsourced (Insinga & Werle, 2000; Sen et al., 2020). Consequently, firms seek to "acquire critical scale for their chosen activity which helps them negotiate hard bargains with their suppliers" (Pratap, 2014), in addition to other means of cost reduction (Belcourt, 2006). The client industry will typically outsource activities that face high competition in the supplier industry. The resources that provide a competitive advantage are non-tradeable, non-imitable, and non-substitutable (Dierickx & Cool, 1989), in other words, valuable, rare, imperfectly imitated, and without equivalent substitutes (Barney, 1991). Outsourcing is based on the suppliers' ability to specialize, thereby achieving higher economies of scale. In essence, suppliers must also be highly competitive with high productivity in order for the client industry to derive maximum benefit from outsourcing.

The Resource-Based View (RBV) framework identifies the resources that serve as the basis for competitive advantage. In the context of productivity and competition, we propose four levels of competitive advantage, as illustrated in Figure 2: Robust, Dynamic, Precarious, and Weak. The most favorable situation is when a firm possesses a robust competitive advantage, characterized by high productivity and low competition. As competition intensifies, the competitive advantage transitions to a dynamic state.

Competitive advantage is considered precarious when both productivity and competition are low. However, the situation can further deteriorate if competition remains high, resulting in a low competitive advantage characterized by low productivity and high competition.

To analyze the impact of competitive advantage on the growth of outsourcing, we consider the competitive advantages of both the client industry and the supplier industry. In order for the client industry to actively pursue outsourcing, its competitive advantage must be dynamic. But, the supplier industry must also exhibit a dynamic competitive advantage for the client industry to have a strong incentive to outsource.

Hypothesis 1: A dynamic competitive advantage of the client industry and a similar dynamic competitive advantage of the supplier industry lead to more outsourcing.

Figure 2: The competitive advantage based on productivity and competition (RBV)

High productivity	Robust <i>competitive advantage</i>	Dynamic <i>competitive advantage</i>
Low productivity	Precarious <i>competitive advantage</i>	Weak <i>competitive advantage</i>
	Low competition	High competition

The Medium Interdependence

According to the Resource Dependence Theory (RDT) perspective, firms rely on resources from their external environments to varying degrees (Pfeffer & Salancik, 1978). These resources, such as capital, labor, skills, knowledge, and technology, are acquired from the external environment (Cheon et al., 1995; Aldrich, 1976; Rundquist, 2008; Chege et al., 2022). As competition intensifies, the client industry's dependence on external resources increases. In a highly competitive environment, the client industry may increase its dependence by subcontracting more to external suppliers.

Firms that have lower dependence on external resources tend to exert more power and influence over others. RDT suggests that firms strive to maximize their power (Pfeffer, 1981) by “altering their structure and patterns of behavior to acquire and maintain needed external resources” (Barney, 1984). Therefore, when the client industry is highly productive, it is more likely to outsource to suppliers in order to leverage their expertise and capabilities, which in turn enhances their productivity and competitiveness.

As per RDT, firms are viewed as open systems that rely on external resources to varying degrees (Pfeffer & Salancik, 1978). The level of dependence on external resources depends on the significance of the resource and the concentration of resource control with limited alternatives. In a highly competitive supplier industry where resource control is concentrated and alternatives are limited, the dependence of the client industry tends to be low, while that of the supplier industry is high. As a result, the client industry develops dependence on the supplier industry with high productivity. However, the supplier industry, due to its high productivity, may reduce its dependence on the client industry. This interplay of dependence and productivity shapes the dynamics of outsourcing relationships between the client and supplier industries.

Resource Dependence Theory (RDT) identifies the resources that create dependence, and we propose four levels of dependence based on the combination of productivity and competition (Figure 3): Low, Medium, High, and Extreme. The most

favorable situation is when dependence is low, which occurs when there is high productivity and low competition (Figure 6). As competition increases, dependence moves to a medium level. If both productivity and competition are low, dependence becomes high. However, the situation can be even more challenging when competition is high, resulting in extreme dependence (low productivity and high competition).

The level of dependence between the client industry and the supplier industry is crucial in analyzing the growth rate of outsourcing. For outsourcing to thrive between these two industries, their level of dependence must be at a medium level, indicating medium interdependence. If their dependence is high, they may seek to reduce it, leading to less outsourcing. Conversely, if their dependence is low, it signifies that they are relatively independent, and therefore there may be limited need for outsourcing.

Hypothesis 2: A medium interdependence between the client industry and the supplier industry leads to more outsourcing.

Figure 3: The dependence based on productivity and competition (RDT)

High productivity	Low dependence	Medium dependence
Low productivity	High dependence	Extreme dependence
	Low competition	High competition

The Difference in Innovation

Non-core capabilities can transform into core capabilities due to various developments (Helper et al., 2000), and as a result, require careful evaluation to prevent potential loss of future competitive advantage (Eisenhardt & Martin, 2000). One approach to consider is retaining in-house core activities while outsourcing non-core activities (McIvor, 2005; Guilhon, 2012). Outsourcing can generate efficiency gains for the outsourcer (Espino-Rodríguez & Padrón-Robaina, 2006), but it may come at the cost of innovation capacity (Gewald & Dibbern, 2009; Cohle, 2019). Thus, it is important to carefully consider whether or not to outsource core competencies of the organization in order to minimize costs or enhance innovation capabilities (Bettis et al., 1992; Quinn and Hilmer, 1994; McIvor, 2008), especially when considering the risk of potential appropriation hazards (Mudambi, 2008).

Numerous studies have focused on understanding how organizations manage environmental interdependence (Hillman et al., 2009; Lai et al., 2013). Dependence and

uncertainties arise when firms lack sufficient resources and/or capabilities to produce goods or services internally (Ganesan, 1994). The ability to acquire and develop resources can reduce dependence and mitigate the lock-in problem (Jayatilaka et al., 2003; Schmitz et al., 2016). However, legal contracts alone may not be adequate to anticipate all uncertainties (Handley and Benton, 2009). It is crucial to recognize that outsourcing entails strategic decision-making and risk assessment, as it is no longer limited to traditional manufacturing or peripheral functions, but increasingly involves critical activities (Hoecht & Trott, 2006; Quélin & Duhamel, 2003; Cantner & Meder, 2007). Firms with a relatively flat learning curve may face squeezed margins in a short span of time (Kim, 2003), as not only the outsourcer's suppliers, but also other competitors, may gain access to the disseminated knowledge (Bettis et al., 1992; Lim & Tan, 2009).

Outsourcing of activities also presents risks in terms of knowledge ownership. When clients outsource, they run the risk of knowledge about those outsourced activities being diffused to suppliers, who may then become competitors. Moreover, this knowledge can potentially disseminate to other competitors as well. Outsourcing only low-innovation potential activities may mean outsourcing to suppliers who are less innovative than the clients, thus reducing the risk of knowledge dissemination that could harm the client.

Hypothesis 3: The difference in innovation between the client industry and the supplier industry favors outsourcing.

Methodology

The Econometric Model

The study examines 20 industries in France that are involved in the production of goods and services (Annex A1). These industries purchase inputs from each other during the period of 2009-2013, based on data availability. Each industry is composed of companies engaged in the same primary business activity. The dataset comprises a total of 1900 observations, with 5 observations per client-supplier industry pair. These observations are divided into two groups: client industries that outsource a significant portion, over 65%, of their production (950 observations), and client industries that outsource a smaller portion, less than 65%, of their production (950 observations), at the national level.

The data for the study are sourced from the Input-Output Table and the ALISSE database (the structural database of businesses) of the French National Institute for Statistics (INSEE), also known as the Institut National de la Statistique et des Etudes Economiques. In order to capture the outsourcing context, data were collected at the industry level for Inputs, Industry Production, Sales, Value Added, Number of Employees, Number of Employees in SME, and R&D Expenditures.

The econometric model employed in the study examines the impact of competition and productivity at both the supplier industry and client industry levels, while also accounting for differences in innovation potentials. The model is specified as follows:

$$\begin{aligned} \text{Growth of inputs}_{ijt} = & \text{Competition}_{jt} + \text{Productivity}_{jt} + \text{Competition}_{it} + \text{Productivity}_{it} \\ & + \text{Difference in innovation}_{ijt} + \text{Growth of production}_{it} + \mu_i + \delta_t + \varepsilon_{it} \end{aligned}$$

where i refers to the client industry while j to the supplier industry, t pertains to a year, Growth of inputs _{ijt} represents the dependent variable which is the purchase of inputs from the client industry i to the supplier industry j at time t , Competition _{jt} denotes the competition intensity at the supplier industry and Productivity _{jt} the labor productivity at the supplier industry, Competition _{it} reflects the competition intensity at the client industry and Productivity _{it} the labor productivity at the client industry, Difference in innovation _{ijt} compares the client industry innovation potential with that of the supplier industry, Growth of production _{it} is the control variable that considers the growth of production of the client industry, μ_i denotes industry specific effects, δ_t represents the specific time effect (common to all industries) and ε_{it} the remainder error term.

In addition, the characteristics of all the indicators and their correlations in the study are presented in the Annexes (Annex A2 and A3). In our analysis, we utilized industry characteristics as variables to provide an overview of our sample of industries in a graphical format (Figure 4).

Dependent Variable

Growth of inputs: The study utilizes the growth of inputs as a proxy for the growth of outsourcing, as defined by the purchase of inputs (goods and services) resulting from the decision to 'make' or 'buy'. The objective is to identify the industry characteristics of both the supplier industry and client industry that contribute to or facilitate outsourcing.

Furthermore, the study examines the increase in purchases by a client industry from a supplier industry in France. The sample comprises 20 French industries, or a total of 1900 observations (Annex C1), as only industries with available data on R&D expenditures were included in the analysis.

Independent Variables

Competition: The intensity of competition in the industry is derived from the share of employment in firms with less than 250 employees, the small and medium enterprises (SMEs). The high share of employment in SME reflects a low degree of concentration (Hu & Schive, 1998; Arslan et al., 2018) favoring new and frequent entry of firms (Ayyagari et al., 2007; Hartwell, 2014) that are sources of more dynamism and competition (Kaplinsky & Manning, 1998).

$$\text{Competition} = \frac{\text{Employment in SME}}{\text{Employment in firms}}$$

These firms are categorized as small and medium enterprises (SMEs) according to definitions by INSEE and the European Commission. The aim of this analysis is to assess the impact of competition intensities in both the supplier industry (Competition_s) and the client industry (Competition_c) on the outsourcing phenomenon.

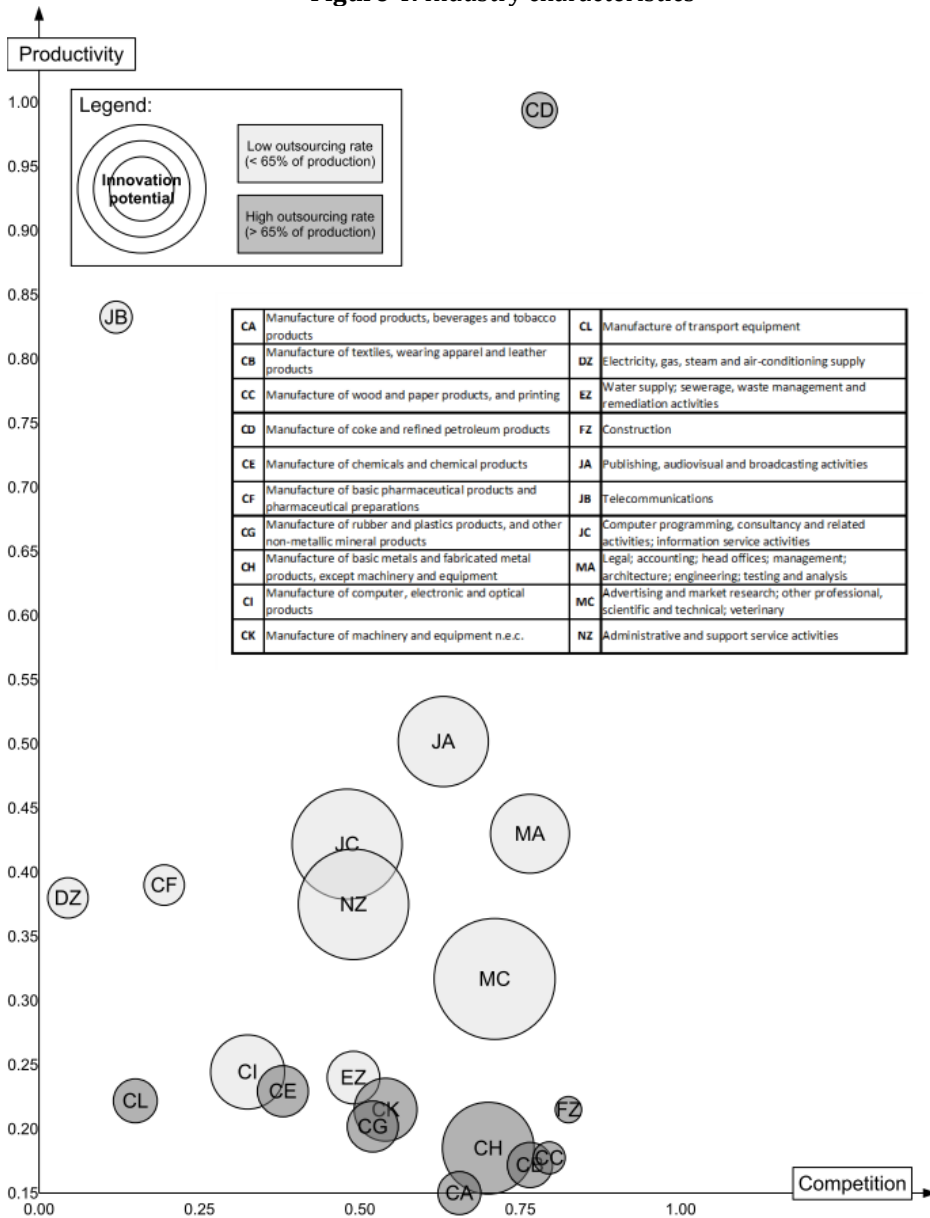
Productivity: The productivity level of the industry is determined by dividing the value added by the number of employees, which serves as an indicator of labor productivity

(Fixler & Siegel, 1999; Thangavelu et al., 2008; Wu et al., 2023).

$$\text{Productivity} = \frac{\text{Value added}}{\text{Employees}}$$

This calculation is performed for all industries. The objective of this analysis is to examine the impact of labor productivities in both the supplier industry (Productivity_s) and client industry (Productivity_c) on the outsourcing phenomenon.

Figure 4: Industry characteristics



Difference in innovation: The difference in innovation between the client industry and the supplier industry is determined by comparing their respective innovation potentials.

$$\text{Difference in innovation} = \frac{\text{Innovation potential}_C}{\text{Innovation potential}_S}$$

This indicator takes into account both the annual R&D expenditure and the average R&D intensity over the study period (2009-2013).

$$\text{Innovation potential} = 1 + \max\left(\frac{R \& D_t - R \& D_{t-1}}{R \& D_t}; 0\right) \times \ln\left(1 + \frac{R \& D_t}{\text{Sales}_t}\right)$$

The innovation potential represents the rate at which new tasks emerge (Chatmi & Elasri, 2013). The objective of this analysis is to assess the impact of the difference in innovation between the client industry and the supplier industry on the phenomenon of outsourcing.

Control variable

Growth of production: The control variable in this study represents the growth of production in the client industry. A higher growth of production in the client industry is expected to correspond to a higher growth of inputs, which is used as a control variable in the estimation of outsourcing growth.

Results

In the two models, the tests conducted lead to the same conclusions. Individual effects and time fixed effects appear. The application of econometric panel data is therefore justified and specifically the individual panel data with random effects and not fixed effects. Indeed, the Hausman test, with a p-value above the 10% threshold, leads to choose the random effects model.

Besides, on the basis of a suitable Wald test, the specific case of homoscedasticity is rejected. In addition to this inter-individual heteroscedasticity, there is also a problem of error autocorrelation. The Wooldridge (2002) test for autocorrelation indicates the presence of first-order autocorrelation (AR1) in our panel data set. The existence of cross section independence was tested by applying the parametric testing procedure projected by Pesaran (2004). The test suggests that residuals are not spatially independent. In this way, there is evidence of contemporaneous correlation across the countries. The Feasible Generalized Least Square (FGLS) estimates are corrected only for heteroskedasticity and autocorrelation whereas "Panel Corrected Standard Errors" (PCSE) estimation corrects heteroskedasticity and autocorrelation but also contemporaneous correlation. Similarly, FGLS and PCSE methods have been employed in the analysis of outsourcing determinants (Sahu & Roy, 2018; Han et al., 2011) as well as in industry-level studies (Ren & Dewan, 2015; Han et al., 2011).

To estimate the two regression models, the Feasible Generalized Least Square method (FGLS) and the method of "Panel Corrected Standard Errors" (PCSE) of Beck and Katz (1995) are applied. Indeed, they allow overcoming heteroscedasticity and autocorrelation problems. However, the results obtained by the method of "Panel Corrected Standard Errors" are more robust (Beck & Katz, 1995). The results are robust

in both cases, and interpretations remain identical regardless of the methods (Table 1). The fact that FGLS and PCSE provide similar estimates indicates that the results are robust.

Analysis of the results relating to the quality of the adjustment shows that the selected variables have significant explanatory power with R^2 between 0.52 and 0.62. The R^2 , reported for the PCSE methodology, indicate that the models have a good explanatory power. In addition, the coefficients are significantly different from zero (Wald χ^2).

Table 1: The results with PCSE and FGLS methods

	Growth of Inputs					
	All industries		High outsourcing rate		Low outsourcing rate	
	PCSE	FGLS	PCSE	FGLS	PCSE	FGLS
Supplier Competition	0.0014 (0.15)	-0.00644 '(-1.49)	0.0170 (1.21)	0.0093 (1.37)	-0.0065 (-0.59)	-0.0017 (-0.38)
Supplier Productivity	0.0703*** (5.61)	0.0447*** '(6.89)	0.0698*** (4.02)	0.0535*** (5.68)	0.0760*** (4.44)	0.0644*** (8.82)
Client Competition	0.0208** (2.46)	0.0137*** '(3.33)	0.0418*** (3.31)	0.0334*** (4.82)	-0.0344*** (-2.74)	-0.0323*** (-5.79)
Client Productivity	0.0946*** (9.00)	0.0797*** '(16.49)	0.1120*** (8.97)	0.1010*** (9.99)	0.0476*** (2.61)	0.0403*** (6.91)
Difference in Innovation	0.347* (1.75)	0.375*** '(3.50)	1.116*** (3.12)	0.871*** (4.29)	0.760*** (3.10)	0.647*** (5.17)
Growth of Production	0.730*** (18.64)	0.796*** '(46.80)	0.633*** (11.51)	0.697*** (23.64)	1.262*** (18.46)	1.287*** (47.08)
Constante	-0.426** (-2.14)	-0.427*** '(-3.95)	-1.214*** (-3.38)	-0.943*** (-4.61)	0.000 (.)	-0.666*** (-5.32)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Errors Adjustment	PSAR(1) Heteroscedasticity	PSAR(1) Heteroscedasticity	PSAR(1) Heteroscedasticity	PSAR(1) Heteroscedasticity	PSAR(1) Heteroscedasticity	PSAR(1) Heteroscedasticity
R ² overall	0.559		0.620		0.521	
Wald χ^2	2036.25***	10200.77***	1401.88***	4683.14***	1025.56***	5636.48***
Nb Observations	1900	1900	950	950	950	950
Nb Groups	380	380	190	190	190	190

Note : Numbers in parentheses are the student-t values

*** Significance at 1% level

** Significance at 5% level

* Significance at 10% level

The variables significant at 1% are productivity of supplier industry, productivity and competition of client industry, difference in innovation and growth of production. Only for client industries with low outsourcing rate, the competition intensity of client industry is negatively significant at the level of 1%. The competition intensity of supplier industry is never significant.

The growth of inputs and the growth of production are logically expected to develop jointly. Additionally, according to Hypothesis 1 and Hypothesis 2, higher productivity in the supplier industry makes outsourcing more attractive for client industries, and client industries with high productivity are more inclined to outsource. Indeed, this conclusion is significant for client industries with both a high and low outsourcing rate. However, the intensity of competition in supplier and client industries needs to be interpreted more precisely according to whether the client industry has a low or high outsourcing rate, as the results only partially validate Hypothesis 1 and Hypothesis 2.

In industries with low rates of outsourcing, the decision to outsource is primarily influenced by the level of competition within the client industry, rather than the competitive intensity of the supplier industry. Thus, client industries with a robust competitive advantage, marked by high productivity and limited competition, tend to engage in more outsourcing. Supplier industries with a robust or dynamic competitive advantage, characterized by high productivity, also experience increased outsourcing. Consequently, industries with low outsourcing rates don't support both Hypothesis 1 and Hypothesis 2. Indeed, it is the low interdependence between clients and suppliers that favors outsourcing. Furthermore, for suppliers, the level of dependence from clients remains insignificant whether it is medium or low.

Conversely, in industries with high rates of outsourcing, the competitive intensity within client industries becomes a pressing concern, as they are compelled to outsource. This imperative to outsource is driven predominantly by the high level of competitive intensity. Therefore, Hypothesis 1 is partially valid for industries with high outsourcing rates, where outsourcing is encouraged when the supplier industry exhibits a dynamic or robust competitive advantage, marked by high productivity. However, for outsourcing to occur, the supplier industry's competitive advantage must align with a dynamic competitive advantage in the client industry, characterized by both high productivity and high competition. In this context, Hypothesis 2 is also partially validated because client industries with high outsourcing rates seek medium interdependence with the supplier industry, albeit with the potential for supplier dominance if their dependence is low.

Furthermore, for both low and high outsourcing rate industries, client industries tend to outsource to supplier industries that are less innovative than them, supporting Hypothesis 3.

For client industries with a high outsourcing rate, a 0.1 increase in supplier industry productivity results in an increase of 0.7 percentage point in the growth of inputs for the client industry. On the other hand, for the same increase in client industry characteristics, such as productivity and competition, the impact on the growth of inputs is either higher or lower, resulting in an increase of 1.1 and 0.4 percentage point, respectively. If the difference in innovation changes by 0.1, the growth of inputs will be higher by 11.2 percentage point. Furthermore, a 1% increase in client industry production growth generates an additional growth of 0.6 percentage point for the client industry's growth of inputs.

For client industries with a low outsourcing rate, the growth of inputs for the client industry will also not change with supplier industry competition, but will increase by 0.8 percentage point if the supplier industry productivity increases by 0.1. On the other hand, a 0.1 increase in client industry productivity only raises the growth of inputs by 0.5% percentage point, while a 0.1 increase in client industry competition actually decreases the growth of inputs by 0.3 percentage point. If the difference in innovation changes by 0.1, the growth of inputs will be higher by 7.6 percentage point. Additionally, an added increase of 1% in client industry production growth generates a higher increase of 1.3 percentage point for the client industry's growth of inputs.

Discussion of Findings

Despite its widespread adoption, outsourcing is not a new phenomenon, and firms have developed expertise in this area over time. It is worth considering whether this expertise, which enables firms to leverage outsourcing while mitigating risks, is reflected in the industry characteristics of both the supplier and client sides.

The Resource Based View

As per the Resource-Based View (RBV) perspective, firms typically focus on their core competencies, which serve as a source of competitive advantage. Hence, non-core activities are often outsourced. However, identifying core activities and deciding whether to retain them can present two opposing situations.

On one hand, a distinction can be made between "true core activities (distinctive and crucial to competitive advantage) and essential activities (advanced activities that are complementary and important for competitive advantage) can be differentiated." (Bals et al., 2013). If the competitive advantage is strong, and so robust, it is possible to retain both true core and essential activities internally, termed as "protected core".

Figure 5: Client industry and supplier industry competitive advantages as a source of outsourcing for client industry with a low outsourcing rate (RBV)

		Client industry competitive advantage			
		Weak	Precarious	Dynamic	Robust
Supplier industry competitive advantage	Weak	Very Low growth <i>Unidentified client core</i> <i>Unidentified supplier core</i>	Low growth <i>Unidentified client core</i> <i>Unidentified supplier core</i>	Medium growth <i>Identified client core</i> <i>Unidentified supplier core</i>	High growth <i>Protected client core</i> <i>Unidentified supplier core</i>
	Precarious	Very Low growth <i>Unidentified client core</i> <i>Unidentified supplier core</i>	Low growth <i>Unidentified client core</i> <i>Unidentified supplier core</i>	Medium growth <i>Identified client core</i> <i>Unidentified supplier core</i>	High growth <i>Protected client core</i> <i>Unidentified supplier core</i>
	Dynamic	Low growth <i>Unidentified client core</i> <i>Identified supplier core</i>	Medium growth <i>Unidentified client core</i> <i>Identified supplier core</i>	High growth <i>Identified client core</i> <i>Identified supplier core</i>	Very High growth <i>Protected client core</i> <i>Identified supplier core</i>
	Robust	Low growth <i>Unidentified client core</i> <i>Protected supplier core</i>	Medium growth <i>Unidentified client core</i> <i>Protected supplier core</i>	High growth <i>Identified client core</i> <i>Protected supplier core</i>	Very High growth <i>Protected client core</i> <i>Protected supplier core</i>

Figure 6: Client industry and supplier industry competitive advantages as a source of outsourcing for client industry with a high outsourcing rate (RBV)

		Client industry competitive advantage			
		Weak	Precarious	Dynamic	Robust
Supplier industry competitive advantage	Weak	Low growth <i>Unidentified client core Unidentified supplier core</i>	Medium growth <i>Unidentified client core Unidentified supplier core</i>	High growth <i>Identified client core Unidentified supplier core</i>	Medium growth <i>Protected client core Unidentified supplier core</i>
	Precarious	Low growth <i>Unidentified client core Unidentified supplier core</i>	Medium growth <i>Unidentified client core Unidentified supplier core</i>	High growth <i>Identified client core Unidentified supplier core</i>	Medium growth <i>Protected client core Unidentified supplier core</i>
	Dynamic	Medium growth <i>Unidentified client core Identified supplier core</i>	High growth <i>Unidentified client core Identified supplier core</i>	Very High growth <i>Identified client core Identified supplier core</i>	High growth <i>Protected client core Identified supplier core</i>
	Robust	Medium growth <i>Unidentified client core Protected supplier core</i>	High growth <i>Unidentified client core Protected supplier core</i>	Very High growth <i>Identified client core Protected supplier core</i>	High growth <i>Protected client core Protected supplier core</i>

On the other hand, when the competitive advantage is weak, it becomes challenging to differentiate between core and non-core activities. The contribution of the activity to competitive advantage may not be apparent, as it is difficult to determine if the resources used are non-tradeable, non-imitable, and non-substitutable. Weak competitive advantage is often associated with low productivity and high competition, leading to difficulties in identifying core activities, referred to as "unidentified core".

The positioning of the supplier industry in comparison to the client industry varies depending on the outsourcing rate within the latter, owing to the influence of competition. When outsourcing rates are low, the client industry typically resorts to outsourcing during periods of low competition to enhance its competitive advantage (Figure 5). Consequently, the core activities of the client industry are protected, at least to the same extent as those of the supplier industry, if not more effectively. Conversely, in instances of high outsourcing rates, heightened competition compels the client industry to intensify outsourcing efforts to uphold its competitive standing, thereby bolstering the competitive position of the supplier industry as well (Figure 6). Here, the core activities of the supplier industry are similarly preserved, at least to the same degree as those of the client industry, if not more robustly. Besides, the decision to outsource is also influenced by the disparity in innovation between the client and supplier industries.

The Resource Dependence Theory

According to the RDT (Resource Dependence Theory), firms aim to mitigate the consequences of their dependence, and therefore tend to limit outsourcing when their dependence is strong. However, two contrasting scenarios can arise based on the level of dependence - low or extremely high.

On one hand, low dependence indicates that the industry possesses high power. In such cases, there may be no need for outsourcing as the industry can exercise its power to meet its needs without relying on external suppliers. Conversely, the client industry may choose not to outsource in order to avoid developing dependence on the supplier industry.

On the other hand, when dependence is extremely high, the client industry becomes heavily reliant on the supplier industry. In such situations, the client industry may try to limit its dependence by outsourcing less.

This issue of dependence is crucial for both the client industry and the supplier industry. In cases where both industries have extreme dependence on each other, they develop a reciprocal interdependence. This can explain why, in such situations, outsourcing growth is low, as both industries attempt to limit their dependence.

The relative power of the supplier industry in relation to the client industry hinges on the outsourcing rate within the latter, with competition dynamics playing a pivotal role. In scenarios where outsourcing rates are low, the client industry exhibits reduced dependence on the supplier industry and may opt to outsource selectively during periods of low competition (Figure 7). Consequently, the client industry maintains low interdependence with the supplier industry, or even assumes a dominant role over it, especially when the supplier industry's dependence is medium. Conversely, with high outsourcing rates, the client industry becomes more dependent on the supplier industry, largely driven by competitive pressures (Figure 8). Here, the client industry maintains a medium level of interdependence with the supplier industry, and there's potential for the supplier industry to dominate it, given its low dependence on the client industry. Besides, the client industry is more inclined to outsource when there is a significant difference in innovation with the supplier industry, thereby leveraging external expertise and capabilities to enhance their competitiveness.

Figure 7: Client industry and supplier industry dependences as a source of outsourcing for client industry with a low outsourcing rate (RDT)

		Client industry dependence			
		Extreme	High	Medium	Low
Supplier industry dependence	Extreme	Very low growth <i>Extreme interdependence</i>	Low growth <i>High interdependence Client dominance</i>	Medium growth <i>Medium dependence Client dominance</i>	High growth <i>High dependence Client dominance</i>
	High	Very Low growth <i>High interdependence Supplier dominance</i>	Low growth <i>High interdependence</i>	Medium growth <i>Medium interdependence Client dominance</i>	High growth <i>Medium dependence Client dominance</i>
	Medium	Low growth <i>Medium dependence Supplier dominance</i>	Medium growth <i>Medium interdependence Supplier dominance</i>	High growth <i>Medium interdependence</i>	Very High growth <i>Low dependence Client dominance</i>
	Low	Low growth <i>High dependence Supplier dominance</i>	Medium growth <i>Medium dependence Supplier dominance</i>	High growth <i>Low dependence Supplier dominance</i>	Very High growth <i>Low interdependence</i>

Figure 8: Client industry and supplier industry dependences as a source of outsourcing for client industry with a high outsourcing rate (RDT)

		Client industry dependence			
		Extreme	High	Medium	Low
Supplier industry dependence	Extreme	Low growth <i>Extreme interdependence</i>	Medium growth <i>High interdependence Client dominance</i>	High growth <i>Medium dependence Client dominance</i>	Medium growth <i>High dependence Client dominance</i>
	High	Low growth <i>High interdependence Supplier dominance</i>	Medium growth <i>High interdependence</i>	High growth <i>Medium interdependence Client dominance</i>	Medium growth <i>Medium dependence Client dominance</i>
	Medium	Medium growth <i>Medium dependence Supplier dominance</i>	High growth <i>Medium interdependence Supplier dominance</i>	Very High growth <i>Medium interdependence</i>	High growth <i>Low dependence Client dominance</i>
	Low	Medium growth <i>High dependence Supplier dominance</i>	High growth <i>Medium dependence Supplier dominance</i>	Very High growth <i>Low dependence Supplier dominance</i>	High growth <i>Low interdependence</i>

Conclusion and Implications

This paper establishes a link between the industry characteristics of suppliers and clients to identify the favorable conditions for outsourcing. The productivity, competition intensity, and innovation potential of an industry are critical factors that influence the flow of inputs in outsourcing decisions, although they have not been studied extensively at the industry level.

The analysis in this study focuses on the growth of outsourcing in French industries from 2009 to 2013. The findings highlight that the characteristics of both client and supplier industries play a significant role in explaining why a client industry outsources more from a particular supplier industry.

First, the dynamic environment of the client industry, including its productivity and competition intensity, influences its outsourcing decisions. Drawing on the Resource-Based View (RBV) theory, when a client industry can and needs to focus on core activities, it is more likely to outsource. Additionally, from the Resource Dependence Theory (RDT) perspective, a low or medium level of dependence of the client industry also drives outsourcing decisions.

Second, the attractiveness of the supplier industry, including its productivity but not its competitiveness, impacts outsourcing. According to RBV, the supplier industry seeks to maintain its competitive advantage by attracting more activities through outsourcing. However, the supply industry takes advantage of the pressure existing on the client industry, either because of its competition intensity coupled with high outsourcing rate, and the supplier industry may be more selective in its client industry outsourcing decisions. RDT also suggests that interdependence between the two industries is sought but the supplier industry can be in a better position to develop dominance.

Third, the difference in innovation between client and supplier industries affects the outsourcing process. Peripheral and less innovative activities are more likely to be outsourced, enabling the client to focus on core activities without the risk of the supplier becoming a competitor.

The main contribution of this paper is to highlight that client industries consider their competitive advantage and dependence in their outsourcing decisions. By outsourcing to efficient (high productivity), competitive (low dependence), and less innovative (limited opportunism) supplier industries, client industries can reduce their dependence and increase their competitive advantage.

Simultaneously, the findings provide insights to supplier industries regarding the characteristics they need to emphasize, as client industries that outsource more tend to be more productive and innovative. Firms can consider these industry characteristics to determine their level of dependence and competitive advantage in establishing outsourcing contracts.

Limitations and Future Research Directions

However, this study has several limitations that should be acknowledged. Firstly, the measurement of competition intensity, productivity, and difference in innovation could be further refined. For instance, additional factors such as modularity, knowledge intensity, presence of clusters, and other relevant industry-specific indicators could be considered to provide a more comprehensive analysis. Moreover, data on international outsourcing and international supplier industries were not available in this study, which could potentially affect the findings.

Secondly, while the study focuses on industry characteristics as a determinant of outsourcing decisions, it does not directly draw conclusions about the suitability of specific suppliers. However, considering the characteristics of supplier industries can help reduce the risks associated with outsourcing. For instance, outsourcing tasks to specialized suppliers with a large pool of options may yield better results. It would also be interesting to explore the impact of modularity, i.e., the standardization of activities, on the ease of outsourcing for certain client industries.

Additionally, the analysis in this study is limited to a select group of French industries, and extending the research to other countries and industries would be valuable. However, the study's timeframe is limited to the years 2009 to 2013 due to changes in nomenclature before 2008, and the post-crisis context during which the data were collected may not fully capture long-term trends. Furthermore, other industry characteristics such as the distribution of industries at local or regional levels, management practices, or the significance of international outsourcing could be explored in future research. It is also important to differentiate between new outsourced activities and previously outsourced activities for a more accurate analysis.

Finally, the study suggests potential avenues for further research, such as incorporating additional indicators like R&D expenditure growth and R&D intensity in calculating the difference in innovation between industries. Furthermore, the study highlights the significant advantages that industry characteristics of suppliers and clients can confer to clients, particularly when facing constraints.

References

- Aldrich, H. (1976). Resource dependence and interorganizational relations: relations between local employment service office and social services sector organizations. *Administration and Society*, 7(4), 419–455.
- Alrwashdeh, M., Adaileh, M.J., & Ali, H. (2022). The impact of outsourcing on operational performance: A field study in industrial companies in Jordan. *Journal of Management Information and Decision Sciences*, 25(S2), 1-13.
- Arslan, Y., Contreras, J., Patel, N., & Shu, C. (2018). "How has globalisation affected emerging market economies? BIS Papers chapters, in: Bank for International Settlements (ed.), *Globalisation and deglobalisation*, 100, 27-55, Bank for International Settlements.
- Ayyagari, M., Beck, T., & Demircuc-Kunt, A., (2007). Small and Medium Enterprises Across the Globe. *Small Business Economics*, 29(4), 415-434.
- Baatarogtokh, B., Dunbar, W.S., & Zyl, D. (2018). The state of outsourcing in the Canadian mining industry. *Resources Policy*. 59, 181-191.

- Bals, L., Jensen, P. D. Ø., Larsen, M. M., & Pedersen, T. (2013). Exploring Layers of Complexity in Offshoring Research and Practice. In T. Pedersen, L. Bals, P. D. Ørberg Jensen and M. Møller Larsen (Eds.), *The Offshoring Challenge: Strategic Design and Innovation for Tomorrow's Organization*: 1 – 18. London: Springer.
- Baraldi, E., Proença, J. F., Proença, T., & Mota de Castro, L. (2014). The supplier's side of outsourcing: Taking over activities and blurring organizational boundaries. *Industrial Marketing Management*, 43(4), 553–563.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Beck, N., & Katz, J. N. (1995). What to do (and not to do) with time-series cross-section data. *American Political Science Review*, 89(3), 634–647.
- Becker, M. C., & Zirpoli, F. (2017). How to Avoid Innovation Competence Loss in R&D Outsourcing. *California Management Review*, 59(2), 24–44.
- Belcourt, M. (2006). Outsourcing: the benefits and the risks. *Human Resource Management Review*, 16(2), 269–279.
- Bengtsson, L., & Dabhilkar, M. (2009). Manufacturing outsourcing and its effect on plant performance—lessons for KIBS outsourcing. *Journal of Evolutionary Economics*, 19(2), 231–257.
- Bental, B., Deffains, B., & Demougin, D., (2012). Credibility and Monitoring: Outsourcing as a Commitment Device. *Journal of Economics & Management Strategy*, 21(1), 31–52.
- Bernasconi, M., Galetti, S., Gattai, V., & Natale, P. (2022) Contract Incompleteness and the Boundaries of the Firm in Times of COVID-19. *Journal of Industry, Competition and Trade*, 22(3), 371–409.
- Bertschek, I., Erdsiek, D., & Trenz, M. (2017). IT Outsourcing—A Source of Innovation? Microeconomic Evidence for Germany. *Managerial and Decision Economics*, 38(7), 941–954.
- Bettis, R. A., Bradley, S. P., & Hamel, G. (1992). Outsourcing and industrial decline. *Academy of Management Executive*, 6(1), 7–22.
- Bhagwati, J., Panagariya, A., & Srinivasan, T. N. (2004). The muddles over outsourcing. *Journal of Economic Perspectives*, 18(4), 93–114.
- Boguslauskas, V., & Kvedaraviciene, G. (2009). Difficulties in identifying company's core competencies and core processes. *Engineering Economics*, 62(2), 75–81.
- Broedner, P., Kinkel, S., & Lay, G. (2009). Productivity effects of outsourcing: new evidence on the strategic importance of vertical integration decisions. *International Journal of Operations & Production Management*, 29(2), 127–150.
- Caniels, M. C. J., & Gelderman, C. J. (2005). Purchasing strategies in the Kraljic matrix – A power and dependence perspective. *Journal of Purchasing and Supply Management*, 11(2–3), 141–155.
- Caniels, M. C. J., & Roeleveld, A. (2009). Power and dependence perspectives on outsourcing decisions. *European Management Journal*, 27(6), 402–417.

- Cantner, U., & Meder, A. (2007). Technological proximity and the choice of cooperation partner. *Journal of Economic Interaction and Coordination*, 2(1), 45–65.
- Carboni, O.A. (2012). An empirical investigation of the determinants of R&D cooperation: An application of the inverse hyperbolic sine transformation. *Research in Economics*, 66(2), 131-141.
- Casciaro, T., & Piskorski, M. J. (2005). Power Imbalance, Mutual Dependence, and Constraint Absorption: A Closer Look at Resource Dependence Theory. *Administrative Science Quarterly*, 50(2), 167-199.
- Ceccagnoli, M., Higgins, M.J., & Palermo, V. (2014). Behind the Scenes: Sources of Complementarity in R&D. *Journal of Economics & Management Strategy*, 23(1), 125-148.
- Chalos, P., & Sung, J. (1998). Outsourcing decisions and managerial incentives. *Decision Sciences*, 29(4), 901-919.
- Chaurasia, S. (2014). An Empirical Analysis of Power in Retailer- Manufacturer Supply Chain Relationship: A Resource Dependency Perspective. *IUP Journal of Supply Chain Management*, 11(1), 52-66.
- Chege, S.W., Kinyua, G., & Muchemi, A. (2022). Strategic Outsourcing as an Antecedent of Organisation Performance: A Review of Literature. *International Journal of Managerial Studies and Research*, 10(1), 64-79.
- Cheon, M. J., Grover, V., & Teng, T. C. (1995). Theoretical perspectives on the outsourcing of information systems. *Journal of Information Technology*, 10(4), 209–219.
- Cohle, Z. (2019) Explaining the Current Innovative R&D Outsourcing to Developing Countries. *Journal of Industry Competition and Trade*, 19(2), 211–234.
- Cox, A. (2004). The art of the possible: Relationship management in power regimes and supply chains. *Supply Chain Management: An International Journal*, 9(5), 346–356.
- Davis, G. F., & Cobb, J. A. (2010). Resource Dependence Theory: Past and Future. *Research in the Sociology of Organizations*, 28, 21–42.
- Dierickx, I., & Cool, K., (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35(12), 1504–1511.
- Edvardsson, I. R., Oskarsson, G. K., & Vesteinsdottir, S. (2011). Enhancing customer services and core competencies: outsourcing in Icelandic service SMEs. *International Journal of Entrepreneurship and Small Business*, 14(3), 313-333.
- Eisenhardt, K. M., & Martin, J. A., (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21(10), 1105–1121.
- Espino-Rodríguez, T. F., & Padrón-Robaina, V. (2006). A review of outsourcing from the resource-based view of the firm. *International Journal of Management Reviews*, 8(1), 49–70.
- Fixler, D.J., & Siegel, D., 1999. Outsourcing and productivity growth in services. *Structural Change and Economic Dynamics*, 10(2), 177-194.

- Foster, L., & He, A. (2022). "Technology and productivity growth. *Business Economics*, 57(3), 111-119.
- Gandia, R., & Brion, S. (2016). How to Avoid Dependence in Video Game Industry: The Case of Ankama. *International Journal of Arts Management*, 18(2), 26-41.
- Ganesan, S. (1994). Determinants of long-term orientation in buyer–seller relationships. *Journal of Marketing*, 58(2), 1–19.
- Gao, X., and Gong, S. (2022). An economic analysis of information security outsourcing with competitive firms. *Managerial and Decision Economics*, 43(7), 2748-2758.
- Garavan, T. N. (2012). Global talent management in science-based firms: An exploratory investigation of the pharmaceutical industry during the global downturn. *International Journal of Human Resource Management*, 23(12), 2428–2449.
- García-Vega, M., & Huergo, E. (2021). Organization of R&D outsourcing: Asymmetric cross-effects between locations. *Journal of Economics & Management Strategy*, 30(3), 503-524.
- Garvey, G.T., & Pitchford, R. (1995). Input Market Competition and the Make-or-Buy Decision. *Journal of Economics & Management Strategy*, 4(3), 491-508.
- Gewald, H., & Dibbern, J. (2009). Risks and benefits of business process outsourcing: a study of transaction services in the German banking industry. *Information & Management*, 46(4), 249–257.
- Grimpe, C., & Kaiser, U. (2010). Balancing internal and external knowledge acquisition: the gains and pains from R&D outsourcing. *Journal of Management Studies*, 47(8), 1483–1509.
- Grossman, G. M., & Helpman, E. (2002). Integration versus outsourcing in industry equilibrium. *Quarterly Journal of Economics*, 117(1), 85–120.
- Guilhon, B. (2012). Les paradoxes de l'économie du savoir. Hermes Lavoisier, Paris.
- Han, K., Kauffman R.J., & Nault, B.R. (2011). Research Note: Returns to Information Technology Outsourcing. *Information Systems Research*, 22(4), pages 824-840.
- Handley, S.M., & Benton, W.C. Jr (2009). Unlocking the business outsourcing process model. *Journal of Operations Management*, 27(5), 344-361.
- Hansen, Z. N. L., & Rasmussen, L. B. (2013) Outsourcing relationships: Changes in power and dependency. *European Management Journal*, 31(6), 655–667.
- Hartwell, C.A., (2014). Capital Controls and the Determinants of Entrepreneurship. *Czech Journal of Economics and Finance (Finance a uver)*, 64(6), 434-456.
- Helper, S., MacDuffie, J. P., & Sabel, C., (2000). Pragmatic collaborations: advancing knowledge while controlling opportunism. *Industrial & Corporate Change*, 9(3), 443–488.
- Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource Dependence Theory: A Review. *Journal of Management*, 35(6), 1404–1427.
- Hoecht, A., & Trott, P. (2006). Innovation risks of strategic outsourcing. *Technovation*, 26(5-6), 672–681.

- Hofer, A.R., Jin, Y.H., & Knemeyer, A.M. (2021). Environmental uncertainty and cross-buying in logistics outsourcing arrangements: a resource dependence perspective. *International Journal of Physical Distribution & Logistics Management*, 51(3), 236-258.
- Hu, M.-W., & Schive, C. (1998). The Changing Competitiveness of Taiwan's Manufacturing SMEs. *Small Business Economics*, 11(4), 315-326.
- Insinga, R. C., & Werle, M. J., (2000). Linking outsourcing to business strategy. *Academy of Management Executive*, 14(4), 58-70.
- Jacobides, M. G., & Winter, S. (2005). The co-evolution of capabilities and transaction costs: Explaining the institutional structure of production. *Strategic Management Journal*, 26(5), 395-413.
- Jacobs, J., & Goebel, B. (2020). The business aviation industry: growth, contraction and consolidation, *Business Economics*, 55(1), 53-61.
- Jayatilaka, B., Schwarz, A., & Hirschheim, R. (2003). Determinants of ASP choice: an integrated perspective. *European Journal of Information Systems*, 12(3), 210-224.
- Jean R.-J. B., Kim, D., & Sinkovics, R. R. (2012). Drivers and Performance Outcomes of Supplier Innovation Generation in Customer-Supplier Relationships: The Role of Power-Dependence. *Decision Sciences*, 43(6), 1003-1038.
- Kaplinsky, R., & Manning, C. (1998). Concentration, competition policy and the role of small and medium-sized enterprises in South Africa's industrial development. *Journal of Development Studies*, 35(1), 139-161.
- Kim, B. (2003). Dynamic outsourcing to contract manufacturers with different capabilities of reducing the supply cost. *International Journal of Production Economics*, 86(1), 63-80.
- Kloyer, M., Helm, R., & Aust, C. (2019). Determinants of moral hazard in research and development supply relations: Empirical results beyond the agency - theory explanation. *Managerial and Decision Economics*, 40(1), 64-78.
- Lacity, M. C., Khan, S., Yan, A., & Willcocks, L. P. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information technology*, 25(4), 395-433.
- Lai, F., Chu, Z., Wang, Q., & Fan, C. (2013). Managing dependence in logistics outsourcing relationships: Evidence from China. *International Journal of Production Research*, 51(10), 3037-3054.
- Lambertini, L. (2010). Make vs Buy in a Monopoly with Demand or Cost Uncertainty. *Research in Economics*, 64(2), 101-109.
- Li, H., Lu, Y., & Tao, Z. (2017). Vertical Integration and Firm Productivity. *Journal of Economics & Management Strategy*, 26(2), 403-428.
- Lim, W. S., & Tan, S. J. (2009). Using brand equity to counter outsourcing opportunism: a game theoretic approach. *Marketing Letters*, 20(4), 369-383.
- Liu F.-H., Tsou, H.-T., & Chen, L.-J. (2013). The impact of OEM supplier initiatives on buyer competence development: The moderating roles of collaborative

- relationship and competitive environment. *Asia Pacific Journal of Management*, 30(4), 1285–1303.
- Liu, X., Qu, W.G., & Pinsonneault, A. (2022). The impacts of industry environment on software insourcing, outsourcing, and buying. *Industrial Management & Data Systems*, 122(7), 1541-1559.
- Lonsdale, C., & Cox, A. (2000). The historical development of outsourcing: The latest fad? *Industrial Management and Data Systems*, 100(9), 444–450.
- Lungescu, C. D., Pampa, V., & Salanta, I. I. (2011). Outsourcing: the benefits and the risks. *Managerial Challenges of the Contemporary Society*, 2(2), 270-273.
- Mahnke, V., Overby, M. L., & Vang, J. (2005). Strategic outsourcing of IT services: Theoretical stocktaking and empirical challenges. *Industry & Innovation*, 12(2), 205–253.
- Manning, S., Massini, S., & Lewin, A. Y. (2008). A dynamic perspective on next-generation offshoring: the global sourcing of science and engineering talent. *Academy of Management Perspectives*, 22(4), 35-54.
- McIvor, R. (2005). *The Outsourcing Process: Strategies for Evaluation and Management*, Cambridge University Press, Cambridge.
- McIvor, R. (2008). What is the right outsourcing strategy for your process? *European Management Journal*, 26(1), 24–34.
- Miyamoto, Y. (2021). Strategic outsourcing and quality choice: Is a vertical integration model sustainable? *Managerial and Decision Economics*, 42(5), 1332-1351.
- Moretto, M., & Rossini, G. (2012). Flexible Outsourcing. *Managerial and Decision Economics*, 33(1), 47-59.
- Mudambi, R. (2008). Location, control and innovation in knowledge-intensive industries. *Journal of Economic Geography*, 8(5), 699-725.
- Narasimhan, R., & Talluri, S. (2009). Perspectives on risk management in supply chains. *Journal of Operations Management*, 27(2), 114-118.
- Pesaran, M.H. (2004). General diagnostic tests for cross section dependence in panels. *Cambridge Working Papers in Economics*. Faculty of Economics. University of Cambridge; 2004. 0435.
- Pfeffer, J. (1981). *Power in organization*. Marshfield, MA: Pitman.
- Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. London, UK; New York, NY: Harper & Row.
- Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79–91.
- Prasad, A., and Prasad, P. (2007). Moving out: toward understanding the complexity of outsourcing in the age of globalization. *Business Renaissance Quarterly*, 2(3), 67-91.
- Pratap, S. (2014). Towards a framework for performing outsourcing capability. *Strategic Outsourcing: An International Journal*, 7(3), 226-252.

- Qu W., Pinsoneault, A., & Oh, W. (2011). Influence of Industry Characteristics on Information Technology Outsourcing. *Journal of Management Information Systems*, 27(4), 99-128.
- Quélin, B., & Duhamel, F. (2003). Bringing together strategic outsourcing and corporate strategy: Outsourcing motives and risks. *European Management Journal*, 21(5), 647-661.
- Quinn, J. B., & Hilmer, F. G. (1994). Strategic outsourcing. *Sloan Management Review*, 35(4), 43-55.
- Ram, N., Sriram, N., & Ravi, S. (2010). Explicating the mediating role of integrative supply management practices in strategic outsourcing: A case study analysis. *International Journal of Production Research*, 48(2), 379-404.
- Rapp, A. (2009). Outsourcing the sales process: Hiring a mercenary sales force. *Industrial Marketing Management*, 38(4), 411-418.
- Ren, F., & Dewan, S. (2015). Industry-Level Analysis of Information Technology Return and Risk: What Explains the Variation? *Journal of Management Information Systems*, 32(2), 71-103.
- Roberts, V. (2001). Managing strategic outsourcing in the healthcare industry. *Journal of Healthcare Management*, 46(4), 239-249.
- Robinson, P., Lowes, P., Loughran, C., Moller, P., Shields, G., & Klein, E. (2008). Why settle for less? Outsourcing report. Deloitte Consulting Report.
- Rodríguez, T. F., & Robaina, V. P. (2006). A review of outsourcing from the resource-based view of the firm. *International Journal of Management Reviews*, 8(1), 49-70.
- Rundquist, J. (2008). World-Class or Good Enough — The Choice of Partner when Outsourcing New Product Development in Medium-Sized Firms. *International Journal of Innovation and Technology Management*, 5(4), 423-445.
- Sahu, S.K., & Roy, I. (2018). Determinants of Outsourcing in the Automobile Sector in India, *Indian Journal of Industrial Relations*, 54(1), 37-53.
- Sen, S., Kotlarsky, J., & Budhwar, P. (2020). Extending Organizational Boundaries Through Outsourcing: Toward a Dynamic Risk-Management Capability Framework. *Academy of Management Perspectives*, 34(1), 97-113.
- Strange, R. (2011) The outsourcing of primary activities: theoretical analysis and propositions. *Journal of Management and Governance*, 15(2), 249-269.
- Tangpong, C., Michalisin, M. D., & Melcher, A. J. (2008). Toward a typology of buyer-supplier relationships: A study of the computer industry. *Decision Sciences*, 39(3), 571-593.
- Thangavelu S.M., Toh M.-T., & Ng, K.K., 2008. Outsourcing and Fragmentation in Singapore'S Manufacturing Industry, *The Singapore Economic Review (SER)*, 53(3), 539-557.
- Tokman, M., Richey, R., Deitz, G., & Adams, F. (2012). The retailer's perspective on the link between logistical resources and perceived customer loyalty to manufacturer brands. *Journal of Business Logistics*, 33(3), 181-195.

- Touboullic, A., Chicksand, D., & Walker, H. (2014). Managing Imbalanced Supply Chain Relationships for Sustainability: A Power Perspective. *Decision Sciences*, 45(4), 577-619.
- Ulrich, D., & Barney, J. B. (1984). Perspectives in organizations: Resource dependence, efficiency, and population. *The Academy of Management Review*, 9(3), 471-481.
- Valiyattoor, V., & Bhandari, A. K. (2020). Outsourcing and firm performance nexus: an analysis using the conventional and panel double-bootstrap procedure. *Research in International Business and Finance*, 54, 101279.
- Vermeulen, B., Pyka, A., La Poutré, J.A., & de Kok, A.G. (2018). Capability-based governance patterns over the product life-cycle: an agent-based model. *Journal of Economic Interaction and Coordination*, 13(2), 311-349.
- Verwaal, E., Commandeur, H., & Verbeke, W. (2009). Value creation and value claiming in strategic outsourcing decisions: A resource contingency perspective. *Journal of Management*, 35(2), 420-444.
- Vitner, M. & Iqbal, A. (2019). What is going right in manufacturing? *Business Economics*, 54(2), 114-121.
- Wayman, M. (2013). Curbing outsourcing risks. *Internal Auditor*, 70(1), 41-44.
- Weigelt, C. (2009). The impact of outsourcing new technologies on integrative capabilities and performance. *Strategic Management Journal*, 30(6), 595-616.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180.
- Wooldridge, J.M. (2002). *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Cambridge, MA.
- Wu, D., Tannen, M., Anyu, J., Ivanov, S., & Xu, F. (2023). Contract manufacturing, market competition, and labor productivity in US manufacturing industries. *Operations Management Research*, 16(1), 377-390.
- Yamaguchi, S., Nitta, R., Hara, Y., & Shimizu, H. (2021). Who explores further? Evidence on R&D outsourcing from the survey of research and development. *R&D Management*, 51(1), 114-126.
- Zhao, X., Huo, B., Flynn, B. B., & Yeung, J. H. Y. (2008). The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain. *Journal of Operations Management*, 26(3), 368-388.
- Zhou, N., Jia, K., & Song, H. (2023). Design of live broadcast service outsourcing contract considering risk aversion and financial constraints. *Managerial and Decision Economics*, 44(2), 848-857.

Annexes

Annex A1

Table 2: List of industries

CA	Manufacture of food products, beverages and tobacco products	CL	Manufacture of transport equipment
CB	Manufacture of textiles, wearing apparel and leather products	DZ	Electricity, gas, steam and air-conditioning supply
CC	Manufacture of wood and paper products, and printing	EZ	Water supply; sewerage, waste management and remediation activities
CD	Manufacture of coke and refined petroleum products	FZ	Construction
CE	Manufacture of chemicals and chemical products	JA	Publishing, audiovisual and broadcasting activities
CF	Manufacture of basic pharmaceutical products and pharmaceutical preparations	JB	Telecommunications
CG	Manufacture of rubber and plastics products, and other non-metallic mineral products	JC	Computer programming, consultancy and related activities; information service activities
CH	Manufacture of basic metals and fabricated metal products, except machinery and equipment	MA	Legal; accounting; head offices; management; architecture; engineering; testing and analysis
CI	Manufacture of computer, electronic and optical products	MC	Advertising and market research; other professional, scientific and technical; veterinary
CK	Manufacture of machinery and equipment n.e.c.	NZ	Administrative and support service activities

Annex A2

Table 3: Descriptive statistics of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Growth of Inputs	1900	-0.00606	0.12968	-0.51028	0.97000
Supplier Competition	1900	0.48344	0.23966	0.03883	0.82364
Supplier Productivity	1900	0.35478	0.25373	0.11870	1.54275
Client Competition	1900	0.48344	0.23966	0.03883	0.82364
Client Productivity	1900	0.35478	0.25373	0.11870	1.54275
Difference in Innovation	1900	1.00003	0.00812	0.96705	1.03408
Growth of Production	1900	-0.01381	0.08734	-0.36237	0.25173

Annex A3

Table 4: Correlation matrix of variables

	Supplier Competition	Supplier Productivity	Client Competition	Client Productivity	Difference in Innovation	Growth of Production
Supplier Competition	1					
Supplier Productivity	-0.4062	1				
Client Competition	-0.0524	0.0207	1			
Client Productivity	0.0207	-0.0441	-0.4062	1		
Difference in Innovation	-0.1201	0.0350	0.1215	-0.0346	1	
Growth of Production	0.0016	-0.0032	-0.1044	0.0834	0.0155	1