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# Outsourcing and Offshoring

*Edited by Mário Franco*





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Published in London, United Kingdom

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<http://dx.doi.org/10.5772/intechopen.87342>

Edited by Mário Franco

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First published in London, United Kingdom, 2021 by IntechOpen

IntechOpen is the global imprint of INTECHOPEN LIMITED, registered in England and Wales, registration number: 11086078, 5 Princes Gate Court, London, SW7 2QJ, United Kingdom  
Printed in Croatia

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library

Additional hard and PDF copies can be obtained from [orders@intechopen.com](mailto:orders@intechopen.com)

Outsourcing and Offshoring

Edited by Mário Franco

p. cm.

Print ISBN 978-1-83968-469-2

Online ISBN 978-1-83968-471-5

eBook (PDF) ISBN 978-1-83968-472-2

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# Meet the editor



Mário Franco is an associate professor of Entrepreneurship and SME Administration at the Department of Management and Economics, Beira Interior University, Portugal. He received his Ph.D. in Management from Beira Interior University in 2002. In 1997, he was a doctoral candidate and participated in the European Doctoral Programme in Entrepreneurship and Small Business Management in Spain and Sweden. He was a director of the Second Cycle (Master) Studies of Management. His research focuses on strategic alliances, business networks, innovation, and business creation. He is also a member of the Center for Advanced Studies in Management and Economics of the University of Beira Interior (CEFAGE-UBI) Research Unit and is currently involved in several research projects on SMEs. He has authored several articles published in journals such as *Long Range Planning*, *R&D Management*, *International Entrepreneurship and Management Journal*, and *Management Decision*, among others, and a variety of books and book chapters published by international publishers.



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# Preface

The world has become more complicated with the rapid change in the global economic environment, and new times require new dynamics and active strategies to cope with fundamental questions. In this sense, two important instruments that can be used by organizations are outsourcing and offshoring. These organizational forms have become applicable as entrepreneurial tools and as consequences of the opportunities and threats caused by globalization.

The concept of outsourcing dates back to the 1940s, during the Second World War, when it emerged in the United States due to the war industry's need to concentrate on improving arms production in order to maintain the allies' supremacy. This industry passed on some activities supporting production to other firms providing services. However, only in the second half of the twentieth century was the concept put into practice in the service sector to stimulate organizations' profitability through subcontracting services. In addition, the offshoring phenomenon has contributed massive structural changes to organizations. Over the last decades, offshoring has fundamentally changed business strategies, processes, products, and services by deconstructing traditional ways of doing business. Therefore, outsourcing and offshoring emerge as strategic tools claiming to respond to current issues in the global economy, a real way to obtain a competitive advantage. These tools are an innovation in the service category allied to the dynamics of core competences.

Outsourcing and offshoring are beginning to be common practices in organizations, focusing on the softest organizational structures and in this way significantly reducing fixed structural costs, whether in production, service provision, or human capital. However, choosing these instruments involves risks and uncertainties since they involve transaction costs between the parties, important matters related to resources and assets and efficient, trusting relations between the contracting and contracted firms. It is therefore essential to make a detailed analysis of these risks in parallel with the benefits arising from these types of organizational mechanisms.

The importance of outsourcing and offshoring has been widely recognized in the literature, evidenced by the notable increase of relevant publications in the past years. Thus, this book studies the benefits and risks of these two organizational strategies. It also presents new perspectives about outsourcing and offshoring in different contexts.

This book is structured into seven chapters.

In Chapter 1, "Outsourcing: Overview and Trends" the authors present some general concerns and concepts about this system along with examples and arguments.

Chapter 2, "Outsourcing: State-of-the-Art in India and an Insight to Coal Mining Industry" examines the topics as outlined in its title and attempts to clarify the main challenges of outsourcing within the Indian context.

Chapter 3, “The Viability of Outsourcing in Organisational Performance: Benefits and Risks” explores the concept of outsourcing as a differentiating tool in an organizations’ performance, emphasizing the benefits and risks. This chapter presents the dimensions to consider when deciding to implement outsourcing, including (1) transaction costs, (2) use of resources, and (3) collaboration between the parties.

Chapter 4, “The Evolution in Transport Operator’s Corporate Structure: Ownership and Governance” offers a new perspective associated with the evolution in transport operators’ corporate structure by examining the dimensions of ownership and governance. This chapter highlights innovation and success factors for the transportation industry, taking into consideration the digital era wave and best practices, and providing recommendations and guidelines to managers, planners and decision-makers.

Chapter 5, “Entry-Mode Selection and Firm’s Productivity across Market Destinations: An Empirical Investigation” investigates the productivity premia of three alternative modes of internationalization for a panel of Italian manufacturing firms: FDI, international outsourcing, and exporting.

Chapter 6, “Onshore? Offshore? How about Firm Coherency?” discusses how the deciding factors for a firm to choose to be on onshore or offshore is the result of its coherency.

Finally, Chapter 7, “Offshoring-Outsourcing and Onshoring Tradeoffs: The Impact of Coronavirus on Global Supply Chain” more precisely describes offshoring–outsourcing and onshoring trade-offs with a focus on the impact of the coronavirus on the global supply chain. The authors examine how the medical industry and other industries have been impacted by the COVID-19 pandemic in relation to the offshoring–outsourcing business. The COVID-19 pandemic resulted in border closure, forcing nations to rethink onshoring.

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# Outsourcing: Overview and Trends

*Yingying Pang, Shishu Zhang and Albert Xin Jiang*

## Abstract

Outsourcing is a valuable strategy for firms to gain more benefits from the global supply chain. Outsourcing can be defined as a business agreement in which a firm is contracting out certain existing parts of the firm to either domestic and/or international third parties. In this chapter, we give an overview to the benefits and disadvantages of outsourcing. We also discuss recent trends in outsourcing; in particular, with the benefit of technology development, robots are starting to join in outsourcing.

**Keywords:** outsourcing and offshoring, pros and cons, industry trends, past experience, future outlook

## 1. Introduction

Outsourcing is one of the current mainstream business strategies for firms to earn more benefits from the global supply chain [1]. According to [2], the U.S. outsourcing industry's revenue grew over 20 billion U.S. dollars from 2010 to 2019. Moreover, globally, the total outsourcing industry revenue increased from 93.1 billion U.S. dollars to 135.5 billion U.S. dollars.

With the blooming of outsourcing, academic researchers conducted studies to better understand the many aspects of outsourcing. To date, Google Scholar has listed approximately 390,000 articles related to the keyword “outsourcing” published since 2010. Although the researchers' interests in outsourcing varied, in recent years many researchers were focusing on outsourcing with Information Technologies [3–5], Logistics [6–8], and Education [9–11]. Researchers are particularly interested in outsourcing with Information Technologies [5, 12], including issues related to cloud computing [13–16] and security [13–15, 17, 18].

In the rest of this chapter, we will first give an overview of the historical background of the development of outsourcing, and the definition of outsourcing. We will then discuss benefits of outsourcing, including lowering cost, improving the focus on core competencies, receiving the best technology within the industry which the firms did not have, and increasing the employees' flexibility. We will also discuss the risks or potential disadvantages of outsourcing. We will also discuss recent trends in outsourcing, focusing on the impact of new technologies including cloud computing and artificial intelligence.

## **2. Historical background**

Outsourcing could trace back to Rome for tax collection [19]. However, the concept of outsourcing was first proposed by Adam Smith in his book *The Wealth of Nations* [20]. This book posited that division of labor and specialization of labor are the key factors for productivity optimization. Smith argued that labor specialization promotes individual productivity and helps groups of employees cooperate with each other.

In the 1830s, innovations on railway networks and telegraph reduced the exchange time of both information and products. The development of the manufacturing industry allowed firms to enjoy the benefits from economics of scale and expand their business areas [21].

Later, in the post-war period, companies were advocated to conduct horizontal acquisition and vertical acquisition. At that time, proposers believed that conglomerate mergers' strategy could help businesses earn better control over both production and market share [22].

However, between the 1970s and 1980s, academics continued to discover that the conglomerate firms were under-performing in the market [23–25].

Then in 1985, Williamson [26] proposed a new concept called Asset Specificity. Williamson illustrated that in order to optimize the company, the company needs to consider both production cost and transaction cost. Williamson identified the differences between these two costs as a function of asset specificity. In addition, Williamson's Transaction Cost Theory [27] presumed that the most advantageous economic organizational structure is the one that was minimizing the transaction cost while maximizing the profit. Williamson defined Transaction Cost as the cost which summarized all the cost to make a transaction except production cost.

Williamson [26] proposed that economic institutions contained two characteristics - bounded rationality and opportunism. While in the exclusive contract situation, asset specificity would be added as a significant factor. When a circumstance consists of all three elements, the economic institutions will coordinate transactions to save limited rationality while protecting both sides from opportunism attacks. This concept was distinct from the traditional concept of profit maximization.

The concept of Asset Specificity helped explain the phenomenon of conglomerate firms under-performing in the market when they should be bringing great advantages to the business [28]. A Conglomerate merger is two or more economic institutions construct an exclusive contract with each other. Compared to the privately held company, the main concept of conglomerate firms already from profit maximization shift to coordinate transactions. Even though the conglomerate merger will reduce the company's production cost, the transaction cost will increase since the company's size is increasing.

Despite Williamson's significant effort on enlightening outsourcing by transaction cost theory, according to [22], Tom Peter was the one who significantly influenced the companies back to concentrate on the firm's core business.

Many firms were inspired by the Core Competency concept [29]. Core competency is a unique value that makes a firm stand out in the marketplace by utilizing its available resources and knowledge. However, the firms based on this concept to reengineering to more focus on the "core" [22].

Meanwhile, the public sector's outsourcing is helping economic institutions to strengthen the idea of Outsourcing. Between the 1980s to 1990s, notably in the U.K., governments are using privatization and outsourcing to reform the public sector. The public sector's reform set an example for firms about the strengths of Outsourcing. The reform also promoted the development of outsourcing in both

the public and private sectors. The U.K. example influenced numerous firms to start to restructure their organizational framework to outsource unnecessary tasks and focus on the core activities [22].

### **3. Definition of outsourcing**

As discussed above, outsourcing as a practical strategic tool has appeared for a long time; however, the official definition did not exist until 1997 [30].

The academics had been arguing about the definition since 1992. However, the broad definition of outsourcing is that it obtains activities that an organization has the knowledge and resources to execute, from outside of the organization [31].

Recently, Ishizaka et al. [1] examined the existing literature from 1994 to 2020 and came to a comprehensive conclusion:

“Outsourcing is a business agreement, either domestic and/or international (known as offshoring), and strategic management initiative for gaining a competitive advantage of a firm by contracting out their existing internal and/or external non-value added functions, and/or value-added functions, and/or core competencies to competent supplier(s) to produce products and/or services efficiently and effectively for the outsourcing firm.” ([1], p. 1, para 4).

Ishizaka et al.'s [1] definition contained multiple elements, including multiple branches and sub-branches. First overall and the most fundamental, Outsourcing is a business agreement. It indicates that demander and supplier reach a consensus through either oral or written agreement.

Outsourcing is a strategic management initiative that uses a contract-out the firm's either existing functions and/or core competencies to earn the opportunity to stand out in the market. This indicated that companies could outsource not only the functions but also the core competencies to the third parties.

Last but not least, outsourcing can be a strategic management initiative by contracting out to qualified supplier(s) to efficiently and effectively produce products and/or services for the outsourcing firm to stand out in the market. This statement is to clarify that outsourcing does not need to be limited to products or services. A company can outsource their business process regardless of whether they provide either physical goods, non-physical goods, or both as long as this contract-out behavior can help the firm optimize productivity and quality.

With such a complex nature of outsourcing, Alexandre Dolgui and Jean-Marie Proth [32] provided some additional information to help clarify Outsourcing. Dolgui and Proth found that the frequent confusions for outsourcing are to separate outsourcing, offshore outsourcing, offshoring, and subcontracting.

The differences between outsourcing and offshore outsourcing are related to the location of the supplier and the outsourcing firm. Outsourcing commonly identified as both supplier and the firm both located in the same country. However, offshore outsourcing defined as the supplier is located in a country different than the firm. On top of that, offshore is classified as the firm constructed a branch in a different country.

According to Dolgui and Proth, practitioners such as managers were more likely to confuse the concept of outsourcing with sub-contracting. Sub-contracting is the firm contract-out partial works to another firm that contain specific resources and/or skills to provide better task results. Outsourcing, on the other hand, is the firm contract-out partial works to the supplier to allow the supplier to collaborate with the outsourcing firm.

In other words, sub-contracting only provides product and/or services that are specified in the contract; meanwhile, outsourcing is defined as the outsourcing firm

establishing a partnership with the supplier. Dolgui and Proth pointed out that outsourcing requires some level of technical and organizational information exchange.

#### **4. Motivation of outsourcing**

Lacity et al. provided a systematic analysis of the motivations of outsourcing [33–35]. They categorized outsourcing into business process outsourcing and information technology outsourcing [33, 34]. Business process outsourcing is contract-out the business process to the entity outside of the company. Information technology outsourcing is contract-out the information technology services to the entity outside of the company. Lacity et al. [35] explained with more details when merging the two as business services outsourcing. The types of outsourcing “include, but not limited to, financial and accounting, human resources, procurement, R&D, call centers/customer service, software development, software support, infrastructure management services, systems integration services, and legal service.”

Lacity et al. [33–35] analyzed over 400 empirical studies from 1992 to 2014. They discovered 19 independent variables frequently shown up crossing six factors [35]. They found that the outsourcing firm had multiple motives to make the outsourcing decision other than just cost-saving. Lacity et al. pointed out that the firm tends to make an outsourcing decision when the firm craves on optimizing the quality and flexibility of the services while the firm wants to have a supplier’s professional skills and global markets in order to focus on the critical services. In other words, the outsourcing firm is looking to use the minimum cost to get the best results and tends to focus on the “core” of the company. However, the firm also considers losing control as a negative effect. This factor will make the firm prefer to make a decision against outsourcing.

In addition to the reasons above, Lacity et al. [35] also found that the outsourcing firm also frequently consider transaction attributes (such as high transaction costs, difficulty formalizing knowledge, high service complexity, and lack of service standards). The outsourcing firm will be more confident when the outsourcing firm possesses a certain level of technical and methodological capabilities. One interesting point is, when the nature of the firm is high degrees of internationalization, the firm more prefers outsourcing and offshoring.

Building on [33–35], Asatiani et al. [36] ran a regression based on a rich data set of 337 companies. They found that the motivation of outsourcing seems to be more dynamic than linear. They point out that even though cost-saving and focus on the “core” is positively correlated with outsourcing, the need for external expertise is a negative factor.

#### **5. Risks of outsourcing**

With all the advantages that outsourcing brings along, there are some risks of outsourcing that require the manager to notice before and after making the outsourcing decision.

##### **5.1 Types of risks**

Aron et al. [37] proposed that outsourcing risks can be divided into four categories: strategic risks, operational risks, intrinsic risks of atrophy, and intrinsic risks of location. Strategic risks referred to the risks related to opportunistic behavior for

both the outsourcing firm and the supplier. The agent problem always comes with the same two reasons: the supplier did not work as hard as the outsourcing firm expected. The outsourcing firm manager cannot be aware of the manager hiring unqualified supplier due to lack of information or resources [37].

Information Leakage issues can happen to the supplier either unintentionally or intentionally. The supplier can either purposely steal the information the outsourcing firm provided and developed as supplier's new advantages or leak the information to the third parties accidentally due to the supplier's imperfect system structure.

Opportunistic renegotiation can be triggered when the supplier realizes that the outsourcing firm heavily relies on their products or services and there are no better solutions in the existing market. In that scenario, the supplier will push the outsourcing firm to renegotiate the distribution of benefits to ensure the supplier's profit maximization.

Operational risks referred to the risks of communication and cooperation between the outsourcing firm and supplier in the period of outsourcing. Operational risks can happen in many circumstances, such as complexity of operations, geographic location differences between the supplier and the outsourcing firm, and the communication barriers and transmit systems between the supplier and the outsourcing firm. Benefit from the information technology rapidly developing, the operational risks keep decreasing. However, lowering the operational risks required to transform massive information outside of the outsourcing firm will significantly increase information leakage's strategic risk [37].

Intrinsic risks of atrophy referred to after the outsourcing decision was made, the outsourcing firm will lose the professional whose expertise in the outsourcing activities. Depending on the outsourcing firm's strategy is focusing on cost-saving or maintain the company's control, this issue can be big or small. It also can interact with the strategic risk of opportunistic renegotiation. When the supplier posse a renegotiation request, if the outsourcing firm still maintains the professions with such expertise, it increases its bargaining power.

Intrinsic risks of location referred to the risk of outsourcing the firm to a remote location. The location risks can be but are not limited to geopolitical risks, sovereign risks, and exchange rate risks. This type of risk ties to the specific of outsourcing location; each region had its own unique cultural and political background. Without the manager understanding the supplier's country in advance, it can increase the possibility that the outsourcing firm must take the extra cost from not familiar with the supplier's country. This type of risk often happens when a manager makes an offshore outsourcing decision.

Overall, the types of risks summarized the possible directions a firm can meet the obstacles and lead to an outsourcing decision's failure. Next, this chapter would like to introduce the risk of outsourcing based on outsourcing processes to understand outsourcing risks further.

## **5.2 Business process risk**

Shi [38] posed that business process outsourcing usually contains two types of risks: market performance risks and organizational risks. Based on the time of outsourcing, Shi divided the risks further into four types. However, within market performance risks when the firm just outsourcing, the balancing cost and outsourcing results and increase customer complaints are tie back to agent problem. Meanwhile, operation shut-down is the side effect of intrinsic risks of atrophy. After time passes, Shi mentioned the risk could become the price or contract creep and low innovation rate. For the change of the price or contract, it can tie back to

the opportunistic renegotiation. As a result of operation shut-down, the firm will have a low rate of innovation due to the profession's loss within such expertise. This risk can refer back to intrinsic risks of atrophy.

For organizational risks, when the firm just outsourcing, the firm will experience losing the specific knowledge that the firm outsourcing to the supplier, loss of confidential information, loss of employees whose contained loyalty and capability and lower the existing employee's morale and productivity. The loss of specific knowledge, loss of employee, and lower existing employee's morale is the side effect of the operation shut-down. However, this type of risk tie to the intrinsic risks of atrophy, which more rely on the manager's decision on cost-saving or preserve the bargaining power. On the other hand, loss of confidential information is the risk of transferring to a new system which indicated this risk tie to information leakage. The risk of lower employee productivity can interpret from two aspects. One of the risk is that the employee's productivity is lower due to the working process has changed due to the firm's recent outsourcing decision. The employees require extra time to adapt to the new methods of doing their old job. The other interpretation is due to the operation shut-down, the resignation wave within the firm, and the low morale among employees, the existing employee became low productive. Lower employee productivity risk can refer back to intrinsic risks of atrophy since all of them are the side effect of operation shut-down.

After the firm adapted to outsourcing, the firm can have organizational risks such as relying on the supplier, losing control of strategic assets, locking in between the outsourcing firm and supplier, adapting to the incompatible architectural style, and unsuitable competitive signaling, Loss of innovation capabilities and strategic flexibility.

Among all the risks above, the incompatible architectural style and unsuitable competitive signaling can tie to both the agent problem and operational risks. The incompatible architectural style indicated that the firm partially sacrifices its operating mode to fit the style supplier provided to cooperate better. And unsuitable competitive signaling indicated the firm permitted some of the non-value-added terms to earn the opportunity to work with the supplier or make the outsourcing process run smoother at the beginning of the outsourcing. However, when time passes by, the existing terms lost their advantages. These two risks can happen cause of the firm lack of necessary information to discover a suitable supplier or in the existing market, there is no existing supplier that can perfectly fit the outsourcing firm's requirement. Therefore, they can tie to both agent problem and operational risks.

As for the lock-in, loss control on strategic assets, loss of innovation capabilities and strategic flexibility, and reliance on the supplier, they all can tie to intrinsic risks of atrophy. Lock-in is due to asset specificity. When the outsourcing firm and supplier made a contract, the outsourcing firm and the supplier are naturally locked in. Cause of the characteristics of lock-in and the how much the outsourcing firm is sacrificing to reach an agreement, the outsourcing firm will lose some level of strategic flexibility or control on strategic assets. Furthermore, on a cost-saving basis, the operation shut-down decision is made, the risks of innovation capabilities loss and reliance on the supplier will exist due to the talent loss. But after all, these risks all relate to the nature of outsourcing and the firm's decision of cost-saving. Therefore, they all refer to intrinsic risks of atrophy.

### **5.3 Information technology risk**

Aubert et al. [39] in total list seven undesirable outcomes: unexpected transition and management cost, switching cost, expensive contractual amendments, disputes



and litigation, service degradation, increased cost, organizational competencies loss, and hidden service cost.

Unexpected transition and management costs are attributed to three risk factors: either the outsourcing firm and/or the supplier's lack of knowledge on the outsourcing, the supplier unfamiliar with the outsourcing firm, and unfamiliar with the legal environment.

Both outsourcing firm and the supplier can increase the transition and management cost when either of them is unfamiliar with the outsourcing process. Furthermore, this situation increases the overall cost for the outsourcing firm to get their expected results. The reason behind that is the outsourcing firm's lack of knowledge of either the outsourcing process or awareness on the supplier's qualification. Therefore, either the outsourcing firm or the supplier's lack of experience in the outsourcing process is the agent problem. Meanwhile, when the supplier is unfamiliar with the outsourcing firm, the firm needs to train the supplier the same as the new employees. The extra training requires the firm to pay the additional cost to smooth the outsourcing process. These risks only exist when the firm needs to adapt the services or unfamiliar system which the supplier provided. It can be identified as operational risks. Also, unfamiliar with the legal environment can be classified as intrinsic risk of location because the legal system gets involved. If the supplier and the outsourcing firm are located in the same region, the supplier should share the same legal system with the outsourcing firm. Then less likely, both sides need to experience the risk of an unfamiliar legal environment unless one of them or both of them are new to outsourcing. Hence, unexpected transition and management cost and its risk factors can be identified as Agent Problem, Operational Risks, and Intrinsic Risk of Location.

Switching cost as an undesirable outcome contained lock-in, repatriation, and transfer to another supplier. Switching cost is the cost the outsourcing firm needs to consider when the firm needs to consider replacing the supplier or not. Asset specificity, a small number of suppliers, economic scope, and interdependence of activities are the risk factors associated with switching costs. Asset specificity is the characteristic of a contract; the number of suppliers and the economic scope decided the outsourcing firm's interdependency level. All the risk factors related to switching cost can be identified as opportunistic renegotiation and intrinsic risks of atrophy. After all, all the risk factors related to switching cost depend on how unique the supplier's resource or knowledge—the more unique, the higher the switching cost. The uniqueness provided the supplier the power to renegotiate and influence the outsourcing firm's decision-making on withholding specific professions to remain bargaining power to the supplier.

Expensive contractual amendment is the cost of adjusting the contract caused by uncertainty, technological discontinuity, and task complexity. Uncertainty indicated that the supplier's performance could not be measured will be forced both sides to adjust the existing contract to confirm shift the invalid performance measurement to the new performance measurement. Invalid performance measurement can happen when either task is too complex or the supplier cannot provide a good performance for the outsourcing firm. The task complexity will discuss shortly. This suggested uncertainty is both agent problem and opportunistic renegotiation. When no supplier in the existing market provides a discontinued technology, the outsourcing firm is forced to renew the contract with the supplier to accept the substitute solutions. Task complexity related to the uncertainty of the future needs, Aubert et al. [39] posed that when the task is too complex when changes appear, both sides are forced to renegotiate the contract. In general, expensive contractual amendments and their related risk factors are classified as opportunistic renegotiation mainly and attached the agent problem.

Disputes and litigation as the undesirable outcomes mainly indicate the issues created by contracts, agreements, and legal environments. Measurement Issues, Lack of knowledge in outsourcing contracts from either the supplier or the outsourcing firm, unfamiliar with the legal environment, and poor cultural fit are the risk factors for disputes and litigation. As mentioned earlier, the measurement issue is the opportunistic renegotiation and agent problem, lack of knowledge in outsourcing contracts from either the supplier or the outsourcing firm is agent problem, and unfamiliar with the legal environment is an intrinsic risk of location. Poor cultural fit belongs to the intrinsic risk of location. Poor cultural fit originated from the cultural differences between the two regions.

Service degradation indicated that the outsourcing company's service after the outsourcing decision is not as good as the firm before outsourcing. Such downgrade is caused by interdependence of activities, the supplier unfamiliar with the outsourcing firm, the size of supplier, supplier's financial instability, measurement issue, and task complexity. As shown before, the interdependence of activities is opportunistic renegotiation and intrinsic risks of atrophy, the supplier unfamiliar with the outsourcing firm is operational risks, the measurement issue is agent problem and opportunistic renegotiation, and task complexity is opportunistic renegotiation. Earl [40] argued that the quality of service largely depends on the supplier's size, financial stability, and expertise. Since the size and stability are the characteristics of determining is the supplier a qualified supplier or not, the supplier size and supplier's stability are referred to as agent problem.

The increased cost is related to the risk factors of the supplier's lack of knowledge with contract management, measurement issue, and the supplier unfamiliar with the outsourcing firm. When the supplier performance but both sides could not come up with a valid measurement to determine the quality of the supplier's performance, it can be caused by either the outsourcing firm lack of effective monitoring methods or the supplier did not provide enough details allow the outsourcing firm to inspect the performance quality.

Organizational competencies loss means that due to the outsourcing firm's getting contract-out to the supplier, the outsourcing firm may experience the loss of the professions and knowledge related to the outsourced part. Organizational competencies loss is connected to the risk of contract scope, close to the core competency, and interdependence of activities. Scope of contract means the more outsourcing firm contract out to one supplier, the harder the outsourcing firm can maintain independence. Meanwhile, when the outsourcing is too close to the "core," the outsourcing activity will cause the outsourcing firm to lose the essential skills [29]. Moreover, this kind of loss can have a negative impact on the future of the outsourcing firm. Organizational competency loss can be identified as intrinsic risks of atrophy since all the risks are shown up after outsourcing behavior happened. The talent loss situation from Intrinsic risks of atrophy can lead to opportunistic renegotiation due to the outsourcing firm heavily relying on the supplier.

The last undesirable outcome is the hidden service cost. Hidden service cost contained three risk factors: task complexity, measurement issue, and uncertainty. Agency theory suggested that when the supplier on purposely created measurement issues to increase the cost assessment challenge due to low morale, then more than likely hidden service cost will increase.

In summary, information technology outsourcing is involved in all four risks. Unlike business process outsourcing, Information technology outsourcing tends to more frequent to have agent problem, Intrinsic risks of atrophy, and opportunistic renegotiation. In other words, the outsourcing firm manager should pay more attention to talents lost and its series of consequences. Simultaneously, the manager should work harder to identify a qualified supplier to avoid undesirable outcomes.

As Asatiani et al. [36] mentioned, the outsourcing factors are dynamic. Many firms are now contracting-out their parts to multiple suppliers [41, 42]. Outsourcing firm can contract multiple parts to multiple suppliers. To increase the firm's control, the manager can even split the business process into several pieces for different suppliers. Therefore, each outsourcing firm will experience its unique challenges since they had its unique combination of outsourcing.

#### **5.4 Risk management assessment**

Existing literature tends to study the outsourcing risk as to the risk management cases instead of developing a measurement tool [43–45]. In addition, many studies only study the Risk Assessment in Information Technology Outsourcing [46–48].

When Aron et al. [37] posed the outsourcing risks into four categories, they also proposed a task decomposition of the process that the bank requested. This process had three steps: identification, formulation of retention strategy, and retention. Aron et al. adjusted this method to fit for outsourcing risk assessment. Identification is based on the four risk categories to identify an outsourcing firm's risks. The next step, the formulation of retention strategy, is managers and researchers propose multiple solutions to determine the best solution for the situation based on the risks. The last step is retention. This step is to execute the solution determined in the second step. For more details, see [37].

Welborn [49] also proposed using a specific assessment tool to help managers and researchers to identified outsourcing risks. Welborn suggested using Failure Mode Effects Analysis (FMEA) to identify outsourcing risk since FMEA is used for risk management. FMEA was evolved from Failure Mode, Effects and Criticality Analysis (FMECA). FMECA was proposed in [50]. It is a traditional criticality analysis assessment tool to identify item failure. FMEA become a popular tool for many industries used to conduct safety and reliability analysis related to systems, products, processes, and services [51].

FMEA suggested that users identified risk categories and then detail specific potential risks. After that, based on severity, frequency of occurrence, and detectability, to score each risk and calculate the Risk Priority Number (RPN) by multiple all three aspects' scores. They are then using a pareto distribution to analyze the RPN of each risk and develop a solution against the high RPN. FMEA is an assessment tool that is able to execute when the process occurs changes repeatedly [51].

Lee et al. [42] take advantage of FMEA's universally suitable features, they used the adjusted the FMEA framework Supply Chain Risk-Failure Mode and Effect Analysis (SCR-FMEA, [52]) and combined it with Monte Carlo Simulation (MCS) to conduct a risk assessment tool which contains both qualitative and quantitative risk assessment.

## **6. Trends and discussion**

### **6.1 Trends in the academia**

Lacity et al. [35] found that there still many mysteries to be revealed. To better understand the motivation of outsourcing, Lacity et al. call for more studies related to governance determinants since there are limited studies on such areas. Lacity et al. [35] encouraged researchers to extend their interest to relate outsourcing with innovation, disclosed more about environmental factors' relationship with outsourcing, and understand more about the outsourcing firm's capabilities and the supplier. Lacity et al. suggested exploring more on outsourcing configurational

methods, discovering new pricing models other than fixed-price model and time & materials model, understanding better on business analytics sourcing, and revealing emerging models. They discuss how outsourcing and its related personnel positively influence marginalized populations and their roles in sustaining the planet. The other future directions are discussed in advisors, the threat of cybersecurity, and the influence of service automation.

In addition, [53] point out that many researchers are aware of lacking longitudinal datasets, and they encouraged researchers to conduct longitudinal studies to help understand outsourcing. Another suggestion provided by [53] is to extend the related personnel to the parties responsible for outsourcing and the other stakeholders whose careers are impacted and/or threatened by the outsourcing decision.

## **6.2 Trends in the practice**

Kakabadse and Kakabadse [41] concluded that outsourcing in the 2000s was more focused on cost management and functional specialization, and differentiation strategy and market response capability would become of the future. The outsourcing cost of data storage, e-commerce, and website setup was drastically reduced. Small and Medium-sized enterprises tend to seek contract-out to the third party by paying the monthly flat fee. In addition, the outsourcing process is from carrying non-core function moving to the core, from a single function extend to a complete business process and/or value-added intangible assets. Meanwhile, outsourcing firms were shifted from manufacturing to small/medium-sized enterprises and public sectors.

Also, the ways of cooperation between the outsourcing firm and the supplier became looser. The outsourcing firm tends to change from recruit single suppliers to multiple suppliers. Moreover, the outsourcing firm tended to produce a white label product to reduce the cost further and maximize the profit. The outsourcing firm also intends to construct a joint venture partnership with the supplier to allow the supplier to join the decision-making process and bear the cost together. Meanwhile, the payment method changed from pre-payment to pay-on-demand.

Due to the rapid development of outsourcing, the company's concept had changed from vertically integrative diversified corporation to the networked enterprise specialized corporation that seeks the best variety in the enterprise network. Also, the outsourcing firm tends to focus on cost reduction of R&D and systems innovation. The supplier tends to just install and run new systems instead of takeover the existing assets. Moreover, the outsourcing firm was transferred their habit of contract-out the entire complex operation to one supplier to assign multiple suppliers based on the professional requirements of each area.

Because of the development of technology, more and more information technology outsourcing strategy has discovered. Hanafizadeh and Zareravasan [53], based on their review of 91 Information technology outsourcing studies published between 2000 and 2018 in over 50 journals, summarized that the following seven strategies are the mainstream strategy of ITO: cloud computing, IT operations and maintenance outsourcing, information system development outsourcing, BPO, offshore outsourcing. The outsourcing firm shows a trend on relying on machine's computing capabilities and using a machine to replace human for repetitive behavior.

## **6.3 New player in the outsourcing industry**

Before we discuss who the new player is in the outsourcing business and the pros and cons, let us briefly clarify some of the concepts first. This section will adopt the concept of cloud computing, big data analytics, and service automation.

Cloud computing is a shared computing technology where software and hardware cooperate with the real-time network to provide users a service which allows user access certain supplier-provided services or functions remotely. Cloud computing consists of Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) [54, 55].

Big data analytics is human adopting advanced analytics techniques on the big data set [56].

Service automation is a concept proposed by [57]. Service automation indicated the service sector used a machine to provide service instead of a human. Lacity et al. [35] referred that service automation as a machine that replaces humans to accomplish highly perceptual tasks and highly cognitive tasks. Brynjolfsson and McAfee [58] believed that the first machine age existed in industrial revolution. At that time, machines replace humans' manual labor. Furthermore, the second machine age is the era in which machines replaced humans for mental work.

Davenport and Ronanki [59] categorized artificial intelligence application in business into three categories: process automation, cognitive insight, and cognitive engagement.

Process automation is the robot using robotic process automation to automate the digital and physical task. The machine simulates humans to input and output information from multiple information technology systems. Cognitive Insight is the robot using massive user data to predict users' behavior and preferences based on algorithms. This kind of robot is usually used for optimized job performance for machines. The tasks that the machine needs to accomplish are too complex for humans; therefore, human jobs are unaffected by this type of machine [59].

Cognitive Engagement is the robot use intelligent agents, machine learning technology, and natural language processing chatbots to interact with a human.

Cloud computing is a technology that allows customers to access products, resources, and/or services remotely by using the software as an interface regardless of the hardware setting. Big data analytics is a technology in which humans use massive data to explore the unfound facts from data producers using the analytic technique. Service automation is a technology using the robot to substitute partial mental work. Due to technological development, the robot is joining the outsourcing industry.

Computer and machine bring great advantages for business. They can help the firms to optimize their efficiency. Meanwhile, they also contained multiple risks and challenges. The following section proposes the possible benefits, challenges, and risks of cloud computing and service automation in outsourcing to bring researchers and practitioners some thoughts.

### *6.3.1 The benefits*

Mainly Cloud Computing Technology contained three benefits: cost-saving, flexibility, and rapidity. One of the main benefits for businesses to select a cloud computing service is to reduce their investment budget in IT [60]. The on-demand pricing model, on some level, exempts the user's partial cost to access the service and the upfront cost to establish such a service [61]. For example, developing a virtual machine algorithm on optimizing resource allocation is the cost that the firm might require to pay upfront [62].

Cloud computing outsourcing allows the firm to enjoy flexibility at the level of allocating resources. The firm is buying the resource based on real-time demand instead of pre-purchased hardware and software. The charming part of such flexibility is that the firm does not need to pay additional costs for idle digital storage space [61].

The firm exploits the characteristics of rapid and flexible cloud computing to conduct many strategies and product tests to determine the best solution for the company [63]. Moreover, Cloud computing allows the firm to rapidly gather the required resources and provide a fundamental infrastructure within a few days [60].

Service automation's benefit needs to target by each specific technology. Process automation is the lowest cost among the three robots and had low user learning cost to access this service [59]. Process automation can help the outsourcing firm save massive time that the employees spend on repetitive low-level mental tasks. In addition, it works excellent for multi-system cross-referencing. This indicated that if a company shifts service to a different provider when a contract is over, the process automation can play the role of a middleman to help smooth the data transfer process.

Cognitive insight mainly helps the outsourcing firm optimize machine's job performance, which means this type of robot will not steal human's job because humans are unable to accomplish a job that this type of robot does [59]. Another benefit is that since this kind of robot has a cognitive function, it indicated that the robot has self-learning and self-optimization functions in understanding users and optimizing the quality of future data collection.

Cognitive Engagement mainly simulates human interaction with customers, this type of robot's cognitive function is enhanced in creating a solution for the users and simulating human language [59]. The benefit of this kind of robot is freeing customer service time from answering a large number of repeated, basic questions.

Davenport and Ronanki [59] found that over half of the company executives they interviewed (51%) motivated by service automation can optimize its products. In addition, many executives agree that service automation can help optimize internal business operations (36%), free up employees to conduct a more creative task (36%), make a better decision (35%), product innovation (32%), optimize external business process (30%), extent the market (25%), access and rational use of scarce knowledge (25%), and only close to one-fifth of the executives (22%) mentions on use service automation to streamlining the company population. This indicated that for most managers, using robots to replace humans is not the primary purpose of bringing in the robot to the company.

### *6.3.2 The challenges*

For cloud computing services, challenges and risks exist for both the service provider and the users. Alali and Yeh [60] expressed their concern about data security risks and the importance of standardization guidance for cloud computing. For service providers, the security risk is to protect all the data from leakage by third parties.

Data breaches are becoming more and more common. Verizon [64] found 3,950 confirmed data breaches during the period from the beginning of November 2018 to the end of October 2019.

Verizon found that the most common cause for data breach involved hacking (45%), errors (22%), social attacks (22%), malware (17%), misuse by authorized users (8%), and physical actions (4%). Meanwhile, most of the breaches conducted by the individual outside of the company (70%), over half of them involved organized criminal groups (55%), some of them involve inside job (30%), and perpetrator involving partner (1%), multiple parties (1%), and an attacker alliance which had four or more members in a single breach (4%) are rare to see. Verizon found that 72% of the breaches target large companies. Moreover, Verizon emphasized that since the business is trending into cloud-based solutions, the use of stolen credentials would increase in the future.



For the service clients, the security risk is to ensure the data storage in the outsourced company did not leak to the supplier company (service provider) and/or the unrelated third parties [60]. Cannon [65] also suggested that the cloud computing designer should focus more on optimizing data privacy protection.

Of course, the proposals above are not groundless. Verizon's report showed that over half of the victims (58%) from the data breaches experience personal data leakage. This indicated that the outsourced company's information gets leakage, and outsourced firm's customers will also be affected. For example, Adobe in 2013 got a data breach that impacted at least 38 million of their customers. The hacker stole 3 million credit card records and login information from Adobe's users. On this basis, tens of millions of user accounts may have been compromised. Even there are risks for the cloud computing service company (the supplier). However, the outcome of a data breach can affect the outsourced firm since the customers belong to the outsourced company instead of the cloud-service provider.

Another risk that is more concerned by the cloud supplier but might affect the outsourced company is local laws and regulations. Since data can be stored anywhere, the cloud service provider and its clients should pay attention to the laws and regulations where the data is stored and related trans-border laws [66]. For example, United States had no single principal data protection legislation [67]. Meanwhile, multiple laws and regulations are available at the federal and state levels. Therefore, the cloud service provider and the outsourced firm need to make sure nothing is crossing the line.

As for service automation, [59] found several challenges exist when a company makes a decision to go service automation. They revealed that close to half of the manager found that it is difficult to retain existing process and system while adopting the service automation (47%), many of the managers discovered that the cost of technologies and expertise are expensive (40%), the managers unfamiliar with service automation and its mechanism (37%), lack of professions in Technology areas (35%), Technology is not yet mature (31%), and technologies have been oversold in the market (18%).

Overall, the challenges discovered from [59] indicated that the obstacles for the outsourced firm could cause by service automation is a newly developing technology. This means that it will be expensive, knowledge and professions are scarce, and the majority of the population unable to understand it. Moreover, since it is a newly developing technology, it also indicated that this technology has many areas await perfection. Meanwhile, the cost of business structure optimization is a crucial concern above all the expense of bringing in the new technology. And of course, last but not least, the concern of robots replacing humans.

### *6.3.3 The risks*

The risk section adopts the risk framework of [37] to discuss cloud computing and service automation risks. The risks contain strategy risks, operational risks, intrinsic risks of atrophy, and intrinsic risks of location. Among them, strategy risks include agent problem, information leakage, and opportunistic renegotiation.

Firstly, there is the strategy risks-agent problem. Aron et al. [37] explained that the agent problem usually indicated that the supplier's outcome did not meet the outsourced firm's expectation and/or the outsourced firm's lack of resources to identify an unqualified supplier. In other words, the outsourced firm felt that they did not get what they paid for. For computers and robots, it is hard to tell whether they "work hard enough." However, based on the supplier's performance, the outsourced firm can determine if the service that the supplier provided is over-price or not.

Choosing a qualified supplier can help the outsourced firm reduce the risk of information leakage in both the cloud computing and service automation areas. The qualified supplier should be the supplier who is qualified both morally and in capability. The capability indicates that the supplier can protect the data by using practical tools and algorithms at both the software and hardware level. The supplier should have the ability to protect the outsourced firm's information both digitally and in-person from both outside of the company and the inside job.

In addition to capability, researchers found that the moral standard is an underestimated factor. Many papers did not consider discovering the moral of the supplier. However, recently, moral becomes more and more critical. Especially now, moral can be the factor that increases opportunity risk. To prevent the moral risk evolved into opportunity risk in opportunistic renegotiation, the authors suggest that an individual third party in either public sectors and/or private sectors construct a standard or guideline to help service providers practice business morally in cloud-computing area and service automation area.

Secondly, there is the strategy risk-information leakage. This indicates that the risk of both cloud computing and service automation will rise continuously. Therefore, the demand for improving data protection is increasing. However, in service automation, there is a dilemma for both the supplier and outsourced company. When the robot uses the black-box model to conduct a prediction and analysis, it significantly increases data security and privacy since no human can "look inside" to see how it works. This can provide the outsourced firm deniability on the outsourced service because they do not have access to the robot and the knowledge. All they get is the results.

However, the white-box model allows inspection from humans, but being able to inspect the robot's working mechanism may also indicate that individuals can access the client's confidential information. The supplier may violate the outsourced firm's data privacy.

Winfield and Jirotko [68] conducted an in-depth discussion on a dilemma between the right of human privacy and for reducing the public harm created by the black-box model. They referenced the "black box" from flight data recorders and proposed an insight that the service provider should create an ethical black box inside the black-box model robots to record the sense data and the decisions. Meanwhile, they also suggest that robots develop moral values to fit human interests.

Thirdly, there is the strategy risks-opportunistic renegotiation. If one party completely controls the relationship, one will gain greater profits and/or voices.

With the trends of cloud solutions and big data Analytics, everything is heavily data related. Even the service automation (such as the cognitive insight and cognitive engagement technology) requires users' data to analyze, predict, and improve. Data become essential for profit. Hence, data protection has become the key to winning the competition in the marketplace.

An immoral cloud computing service supplier may get involved in the data breach and identity stolen in such a condition. However, the service automation outsourcing firm will experience the same harms as cloud computing service plus the company's core strategy or the newly developed technology got duplicated or stolen.

Worst scenario, the supplier based on the customers and technologies the outsourced firm provided to optimized and develop an upgraded version of substitute product/service. The outsourced firm may be forced to pay to become the middleman between the supplier and the customers. The outsourced firm forced the founder to transfer to its distributor.

The mechanism of this scenario is the same as when the firm in the 20th century determined automated the internal business process, due to the automation has evolved into too complicated. The firms began to have to outsource the process [69]. However, in this case, the outsourced firm did not force to outsource the business process. The firm was forced to outsource the core competence, which made them unique in the market.

Once the outsourced firm is caught in this predicament, it is difficult to leave this situation. The robots can optimize the product/service so rapidly that no human can follow, the outsourced firm became experienced the dilemma of either the firm become the distributor of the supplier company under the pressure of peer competition, or the entire company needs to experience a path shift in the core competencies.

To avoid this situation, the authors suggest focusing on agent problem and information leakage to seek solutions. First of all, if the outsourced firm can find a morally qualified supplier, this situation can be eliminated. Of course, most of the time, the outsourced firm did not have the resource and information to avoid unqualified suppliers is the reason push the firm into this situation. That is why data protection capability comes along. When a supplier is qualified both morally and in capability, the supplier can design an encryption algorithm and safety code that only the client (the outsourced firm) can access the data and/or the results and services from a black-box model robot. In this way, even the supplier firm did not have access to the outsourced firm's data and knowledge. Even when an error occurs, the firm can invite the government and the public to inspect the supplier firm to fix the issue.

Fourthly, there is the operational risks. Operational risk happens between the supplier and the outsourced firm when outsourcing is on-process. It usually is the risk of the communication and/or transmission systems between the supplier, and the outsourced firm is different. This risk exists at the beginning of the new outsourcing relationship for both cloud computing and service automation. The more the outsourced firm changed the supplier, the operational risks increase. If the firm changes its supplier every three years, the operational risk will higher than the firm changes its supplier every five years.

However, changing the supplier is more expensive for the first time change to cloud computing and service automation. When the firm first outsources cloud solutions and service automation, the firm needs to take risks and costs to digitize all the existing information. Also, service automation requires optimizing the business structure to fit for service automation. After that, when the outsourcing company shifted between the suppliers, they already had the foundation to work with cloud computing service and service automation. All they need to do now is to transmit the data and adjust the existing structure to fit the new supplier better.

Operational Risk and its cost now are turning into a common obstacle for the outsourcing firm executives who preferred the service automation technology. After all, nearly half of the executives in [59]'s study found that the existing business structure is not compatible with service automation technology.

Fifthly, there is the intrinsic risks of atrophy. Due to now the cloud computing and service automation are still a newly developing technology, this risk exists when the firm decides to adopt cloud computing and service automation. This is one of the main issues discussed in [59]. The executives that adopted service automation technology disclosed that the service automation technology is so complicated that the professions are scarce and expensive. The executives have difficulty understanding the technology.

For cloud computing, the challenge and the risk are similar. Maybe cloud computing will be a little user friendly than service automation when it comes to the

feeling of use. However, when it comes to data protection and maintenance professions, the outsourced firm will have to outsource all the services to the supplier firm who is storing the outsourcing firm's data since the Encryption Algorithm, the hardware, and the software is all owned by the supplier.

Besides, there is the intrinsic risks of location. For both cloud computing and service automation, the main issue for this risk is where the location is that stores all the data. When data is transfer across states and even countries, the Intrinsic Risks of location increase.

Last but not least, there is one more challenge: the money issue. Davenport and Ronanki [59] showed that 40% of executives disclosed that the technology is too expensive. Meanwhile, an artificial intelligence project launched by the MD Anderson cancer center using IBM's Watson cognitive system to diagnose and recommend treatment plans for certain forms of cancer got suspend due to the cost of the program is rising to \$62 million in 2017. This example gives an example of how expensive service automation technology can be. The large corporations might be able to handle such a price, but it is hard for small and medium firms to access the benefits of service automation such as IBM's cognitive system.

With this challenge, the authors of this chapter suggest the outsourcing firm with the same or similar interest construct an alliance to group all the outsourcing firms' budgets. The alliance can determine the permissions of the technology based on agreement or contract for each type of alliance member. However, the alliance is the one sign the contract with the supplier and fund the supplier's expensive new technology.

In recent decades, the supply–demand relationship in outsourcing is leaning toward buyer's market. However, due to the advantages that computers and robots created, the outsourcing industry will fall back to the seller's market.

## **7. Suggestions and recommendations**

In this section we provide some suggestions and recommendations for researchers and practitioners.

Davenport and Ronanki [59] disclosed that only 22% of executives consider service automation as the solution to cut off headcount. Even though the robot is great, but the errors are more invisible than the previous. Davenport and Ronanki [59] suggested that the reallocated employee can switch to a big data analyst. However, for the front-line employees, can the trial-and-error clerk be their next career opportunity? Amazon Echo's example showed us that some of the errors might be detected only by humans. Does the outsourcing firm need the human agents to trial run and detect the possible robot issues before the product or service release to the public? Since the ultimate question is “will robots replace human labor or not?” this paper calls for future researchers to record and track the executive's decision making after the service automation outsourcing to reveal how the managers avoid the dismissal tide and relocate the existing employees.

Due to the dynamic, complex nature of its rapid development in the outsourcing industry, we feel the need to enhance the call for paper on longitude study. Based on the challenges section disclosed above, the tools and standardization of data protection are awaiting exploration and perfection. How to handle the balance between human privacy and artificial intelligence black-box model should bring more attention. We suggest that future researchers join the discussion and provide more suggestions and guidelines to help the industry construct such an issue.

We also call for a paper on the education field to discuss the future needs for human resources. Now, society is starting to use robots to help humans live better,

but it already showed the challenge of the public unfamiliar with the robots and their working mechanism. Are future talents need to improve such skills? Or is this the service supplier's obligation to make robots more user-friendly? We call for more papers on the topic of cloud computing and service automation in outsourcing. In addition, we call for more empirical studies to reveal the pros and cons of cloud computing and service automation. For the practitioner in the outsourcing industry, this paper recommends the executives consider constructing a network that allows all the buyers group their limited budgets to gain access to high-tech to help the business lower the cost and optimize the business. We also recommend that executives pay attention to the supplier's moral value and construct a method to gain more control over the company's core intangible assets.

The final recommendation requires researchers and practitioners' cooperation. Lacity et al. [35] concerned about an undereducated outsourcing advisor can affect the expensive decision-making and can have a long-term influence for the companies. Meanwhile, Davenport and Ronanki [59] disclosed that some executives were unfamiliar with the service automation technology and its mechanism. In addition, Asatiani et al. [36] proposed that outsourcing is a complex and dynamic business strategy. With all these difficulties, we suggest that researchers and practitioners should team up together. Researchers help the practitioners to understand the outsourcing strategy and its related area professionally. Meanwhile, practitioners help researchers provide the research data and information to help academia understand the outsourcing topic better.

## 8. Conclusion

In this chapter, we briefly introduced the historical background of outsourcing, clarified the definition of outsourcing, discussed the motivation and risks of outsourcing, introduced the tools of risk management assessment. We also discussed the trends in outsourcing, focusing on the impact of cloud computing and service automation technology. Lastly, the chapter ends with recommendations for future researchers and practitioners in the outsourcing industry.

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# Outsourcing: State-of-the-Art in India and an Insight to Coal Mining Industry

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## Abstract

In the present era of globalization, outsourcing proves to be one of the prominent and emerging business practices widely adopted by the firms around the world in order to stay competitive. The academic literature on outsourcing in the Indian context mostly deals with the outsourcing of information technology/information systems (IT/IS) and business process outsourcing (BPO) that are outsourced to Indian IT firms by the multinational companies (MNCs) located abroad. However, studies on outsourcing practices followed by the Indian firms may be inadequate in the extant literature. It was observed that the decision of outsourcing is often taken in an aggressive manner with an emphasis on short-term cost advantage rather than giving due consideration in realizing the significant contribution of such decisions over the long-term competitiveness of the organization. The present study provides a structured approach to analyze the suitability of outsourcing in line with the organizational strategy for performance improvement for the coal mining organization in India.

**Keywords:** outsourcing, India, coal mining industry, decision model

## 1. Introduction

In the present era of globalization, outsourcing proves to be one of the prominent and emerging business practices widely adopted by the firms around the world in order to stay competitive [1]. There are various definitions and explanations of outsourcing in the literature, all mostly conveying a similar meaning. Outsourcing is an abbreviation for “outside resource using” which essentially means using external parties in the value chain of a firm [2]. Outsourcing is defined as a management approach in which an enterprise delegates its operational responsibilities to an external party which was prior performed in-house [3]. Tadelis [4] defines outsourcing as “the transfer of a business activity or function to an external provider (or vendor) who takes control of the activity’s inputs, and then performs that function off the company’s balance sheet and sells the activity/function back to the company”. Outsourcing to third-party firms when based within the same continent or substantially in the similar cultural environment is termed as near shore outsourcing whereas third-party vendors when based on a different continent or substantially in a different cultural environment is termed as offshore outsourcing [5, 6].

Hätönen and Eriksson [7] and Zhu et al. [8] define outsourcing as one of the strategies that are being recently practised among most of the manufacturing and service industries so as to gain competitive advantage. Considering the potential benefits of such a business practice in terms of catering to the customer requirements in reduced time and cost, a wide application of outsourcing has been noticed by industries all over the globe. Though originated in the eighteenth-century, such business endeavour has gained prominence during the 1980s. Since then there has been a massive paradigm shift in such a business outlook [9, 10]. Traditionally, outsourcing practices were confined to peripheral jobs like cleaning, catering, and security that has shifted to potential core jobs like design, research and development, manufacturing, mining, human resource, sales and marketing [11–15]. A large number of firms view outsourcing as a value-addition process and a means to achieve business transformation [16, 17]. Thus, the motivation of outsourcing that was solely based on cost criteria has gradually transformed into a strategy-based approach more likely to be known as transformational outsourcing. In this reference certain concepts like vested outsourcing, crowdsourcing, white collar outsourcing has emerged in the era of 21st century.

Outsourcing has offered several benefits to the organizations that have enabled managers to use it as a strategic tool to be ahead in the competitive race [18]. The motivation for outsourcing differs from one organization to the other and accordingly a wide spectrum of possible benefits is witnessed in the existing literature. Outsourcing has been a proven mechanism in offering a plethora of strategic benefits including skilled workforce, state-of-the-art technology, cost reduction, greater flexibility are to name a few [19, 20]. Organizations have experienced several other benefits of outsourcing, some of them are mentioned below [21]:

- Outsourcing non-value-added activities to third-party service providers allow the companies to focus on their core activities. Outsourcing non-strategic activities allow the client firms to invest in capital, resources, and time to the areas that contribute to the competitiveness of the firm [22–24].
- Outsourcing allows the companies to achieve cost-savings in terms of reduced overheads and consequent training costs by delegating low-skilled and labour-intensive activities to low-cost locations [25, 26].
- Outsourcing enables organizations to achieve cost-savings by capitalizing on economies of scale gained through production efficiencies and specialized personnel of the outsourced firm [22, 27].
- Outsourcing allows achievement of improved and quality services due to service provider's standardized and consistent service levels which ensures an improved and appropriate level of service through their specialized equipment and expertise [28, 29].
- Outsourcing enables organizations to convert fixed cost into variable cost. Components that are required occasionally are often selected as the candidates for outsourcing since maintaining capacity for such items may lead to cost incurrence throughout the year [30, 31].
- Outsourcing enables organizations to gain access to the state-of-the-art and most effective technology, innovation, proven methodologies, and specialized capabilities of the outsourced firm [10, 27, 29].

- Outsourcing enables firms to deliver products/services at a much-reduced time. Reduced cycle time leads to better responsiveness in catering to the ever-changing customer needs through the utilization of state-of-the-art technology, specialized knowledge, and expertise workforce [2, 32, 33].
- Outsourcing brings in greater flexibility. Outsourcing is beneficial at times when sudden necessity arises for a certain resource that may be either human or equipment that are not required on a full-time basis [30, 34, 35].
- Outsourcing is helpful at times in terms of sharing risks when conditions like market fluctuations, volatile financial conditions, and change in government regulations occur [32, 35].

Though outsourcing has been considered as a strategic tool in providing organizations with a competitive advantage, there are quite a few drawbacks which adversely affects the firm in form of cost escalation and inherent risks [30, 36]. Some of the outsourcing risks are highlighted as follows:

- Outsourcing may lead to loss of core competencies of the firm. It has been witnessed that firms often indulge in an aggressive outsourcing in view of the short-term cost advantage failing to realize the significance of such an activity in contributing to the long-run competitiveness of the firm [32]. Delegating a potential activity may be vulnerable in terms of the service provider becoming a competitor in the near future [21].
- Dependency on the service provider sometimes leads to opportunism demonstrated by the service provider which is another risk factor in an outsourcing relationship. Opportunism occurs when individuals act deceitfully and in a self-seeking manner as and when need arises [37, 38]. Such negative behaviour influences an outsourcing relationship by increasing cost and decreasing revenue [39].
- Client organization investing in specialized assets and resources (tangible and intangible) that are specific to that relationship often encounter difficulties in switching providers known as lock-in situation. Interruption of supply, delivery of inferior quality of products, unexpected cost escalations, and non-performance of the service provider are some of the complications encountered by the client organization in such situation [37].
- One of the primary motives behind outsourcing is to gain cost advantage. However, there are several unexpected costs associated with outsourcing such as, cost of monitoring, implementing, negotiating, coordinating, enforcing and terminating the existing exchange agreements that goes unnoticed and unreported while taking an outsourcing decision [32].
- Possession of proprietary knowledge and methods, customer specific data, organizational know-how are examples of intellectual capital that need to be identified and protected through contract clauses when engaging a third party as they can be easily copied and thereby prone to risks and leakages [40, 41].

The academic literature on outsourcing in the Indian context mostly deals with the outsourcing of information technology/information systems (IT/IS) and business process outsourcing (BPO) that are outsourced to Indian IT firms by the

multinational companies (MNCs) located abroad. However, studies on outsourcing practices followed by the Indian firms may be inadequate in the extant literature. It was observed that the decision of outsourcing is often taken in an aggressive manner with an emphasis on short-term cost advantage rather than giving due consideration in realizing the significant contribution of such decisions over the long-term competitiveness of the organization [42]. The present study provides a structured approach to investigate the appropriateness of outsourcing, as a strategic decision, in accord with the organizational strategy for performance improvement in the context of an Indian coal mining organization. Therefore, the objectives of the present study are to provide a general overview of outsourcing in the backdrop of the Indian outsourcing scenario focussing on the coal mining organization and manufacturing and service industries in general. The study then discusses the significant contribution of the coal mining organization in reference to the growing importance of coal in the country. Subsequently, the relevance of outsourcing in view of the improved organizational performances for the Indian coal mining organization has been elucidated. Finally, the study proposes an outsourcing decision model that may provide a comprehensive approach towards evaluating the appropriateness of such strategic decision as outsourcing in consistent with the organizational strategy for performance improvement for the coal mining organization in India.

## **2. Outsourcing: state-of-the-art in India**

As aforementioned, the extant literature on outsourcing in the Indian context mostly highlights outsourcing of IT, IS, and BPO that are offshored to Indian IT firms by the MNCs located overseas [43, 44]. However, studies on outsourcing practices by the Indian firms may be inadequate in the extant literature. According to the outsourcing survey by Deloitte, the business functions that are recently being outsourced are IT, operations, finance, human resources, legal, real estate/facilities, procurement, and sales/marketing support [45]. As reported in this survey, while IT, finance, and operations are expected to be heavily outsourced in offshore locations, business functions such as procurement, human resources, sales and marketing, legal, and real estate/facilities are likely to be outsourced within the national boundaries (India). Some of the publicly known cases of outsourcing by Indian firms are (a) IT outsourcing contract to IBM by Airtel [46], (b) outsourcing of business process and technology by Indian banking sector [47], (c) outsourcing of mining operations by Hindustan copper Ltd. and Mahanadi Coalfields Ltd. [48, 49], (d) outsourcing of back-office operations to Tata Consultancy Services (TCS) by Passport Seva, Ministry of External Affairs [50], (e) outsourcing of passenger services by Indian Railways [51], and (f) human resources management system outsourcing contract to TCS by the Indian Railways [52]. Some of the recent cases of outsourcing reported in Indian context that are more transformational in nature are relocation of high-tech industries like pharmaceutical industry outsourced to India [53], study of professional service outsourcing in India while examining the impacts of task traits (complexity, connectivity and security) and their alignments with inter-firm governance control mechanisms in improving service capabilities by Jayaraman and Liu [54], the impact of employer branding strategy on employee engagement consideration a case of a business process outsourcing (BPO) in India [43], and R & D offshore outsourcing to India, the service provider, taking into account their innovation performance gained through learning from their clients for a biopharmaceutical industry [55].

### **3. Importance of coal and the coal mining organization in India**

Mineral and mining sectors play a pivotal role in the economic development of a country as they are the principal source of raw materials for an array of industries. Among them, coal is the most dominating energy resource and remains as the lifeline for fuelling Indian industries since its first use in the 1700s. Coal mining constitutes a share of 80% of the total mining in India while the remaining 20% includes mining of various other ores such as gold, copper, iron, lead, bauxite, zinc, etc. [56]. At present coal contributes about 52% to the India's total commercial energy needs and about 66% of the country's power generation and is expected to remain the most viable energy resource contributing to sustainable economic growth for the years to come [56–59]. As India is among the top three fastest-growing economies in the world, the coal mining industry in India plays a substantial role in fulfilling the uprising demand of coal from the increasing power plants, steel, and cement industries.

The state-owned coal mining organization of India came into existence in the year 1975 after the Coal Mines (Nationalization) Act in the year 1973 taking over the private coal mines by the Government. For the purpose of this study, this organization is referred to as the Indian coal mining organization (ICMO). ICMO owns seven coal producing subsidiaries along with a mine planning and consultancy company located in eight provincial states in India. They are Eastern Coalfields Limited (ECL), Bharat Coking Coal Limited (BCCL), Central Coalfields Limited (CCL), South Eastern Coalfields Limited (SECL), Western Coalfields Limited (WCL), Northern Coalfields Limited (NCL), Mahanadi Coalfields Limited (MCL), and Central Mine Planning and Design Institute Limited (CMPDIL) [57]. Ministry of Coal (MoC) is responsible for the development and implementation of policies and strategies for the entire coal sector that are exercised through ICMO and its subsidiaries along with Singareni Collieries Company Limited (SCCL) which is a public-sector undertaking company jointly governed by Government of Andhra Pradesh and the Government of India [56]. ICMO is of strategic importance to the country because of several reasons as mentioned below [57]:

- India is the third largest coal-producing country in the world after China and USA where ICMO contributes to about 81.1% of India's overall coal production and is the single largest coal producer in the world.
- Out of the 52% of India's primary commercial energy which is coal-based, ICMO alone contributes to around 40% of the primary commercial energy requirement.
- ICMO accounts for about 74% of the Indian coal market.
- ICMO maintains the stability of coal prices to the Indian coal customers.

The main business of the organization is based on the identification of coal reserves, coal exploration, design, optimization and application of operational activities for excavation of coal while distributing them to industries across the nation as per the demand.

### **4. The Indian coal mining organization and outsourcing**

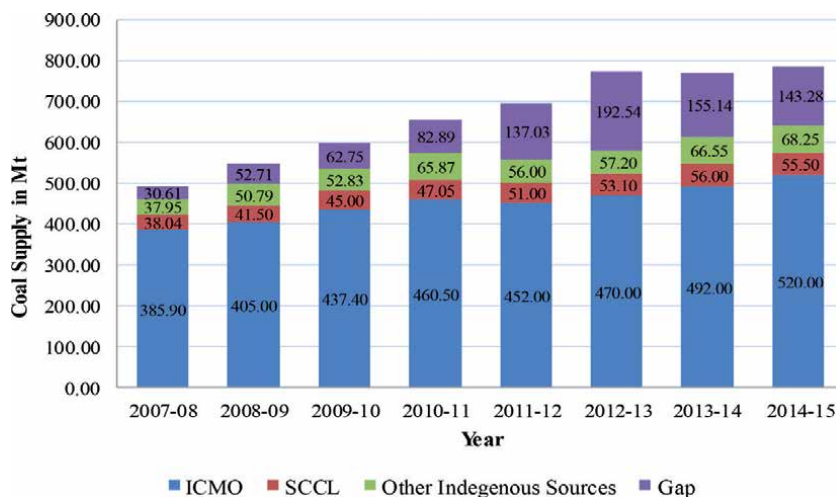
As coal is an important source of primary energy in India, the demand for coal has always been on the rise. The demand for coal has further aggravated in view of

the increasing power sectors and steel and cement industries growing nationwide. Despite the fact that India has been ranked fourth in terms of the total coal reserve and is also considered as the third largest coal producing country in the world, India is still chasing to encounter the escalating demand of coal.

As per the Coal India Report (2014–2015), between 2007–2008 and 2014–2015, the demand for coal in India has increased from 492.5 million tons (MT) to 787.03 MT showing an increase of 60% over a period of seven years. **Figure 1** illustrates the year-wise details of overall demand for coal and the corresponding share of ICMO, SCCL, and other indigenous sources contributing to the overall demand while the gap is met through import [57].

From **Figure 1** it may be observed that the share of demand met by ICMO, SCCL, and other indigenous sources have always been substantially below the expected demand which has necessitated the coal mining organization to depend on coal imports from the neighbourhood countries. The gap, bridged by import between the period 2007–2008 and 2012–2013 has increased from 30.61 MT to 192.54 MT, showing a rise of 529% over a period of five years.

The Ministry of Coal articulates several reasons for such dependency on imported coal. As stated, increasing unavailability of indigenous coal, limited availability of coal with desired quality, environmental consideration in combining the low-quality coal with good quality imported coal, and locations-based cost issues are among the primary influencers [57]. However, coal imports are associated with certain risks and challenges that include fluctuations in global spot prices and foreign exchange rates, law and order issues in exporting countries, and many more [60]. In view of the growing inclination towards the import of coal from overseas sources, there have been several initiatives to enhancement in-house coal production to the outmost possible which are within the ICMO’s 12th Five-year plan. The strategies within the 12th Five-year plan include enhancement of exploration drilling capacity, introduction of new mines, and fast initiation of activities related to projects in-process [57]. However, the improvement and expansion of in-house domestic mines involve a substantial amount of investment resulting in a considerable increase in the price of coal [60]. At the same time, it has been also noticed that service providers have facilitated firms in enhancing their business processes though their technical efficiency, expertise, cost-saving techniques, and flexibility when they were deployed for operational activities. Likewise, the captive mines



**Figure 1.** Year-wise demand and supply of coal.



have realized competitive advantage through deployment of modernized equipment, adoption of new technologies, and utilization of experience and expertise of the service providers [60]. The presence of these third-party private agencies has also been noteworthy in the development and operation of coal mines through contract mining and related technical services.

In view of the significant participation of the third-party providers, the coal mining organization in India have started several interventions involving such organizations to delegate some of the key operational activities. This, in turn, is expected to diminish the ever increasing demand–supply gap through increase in operational efficiency, cost-reduction techniques, sustainability of operations and minimization of wastes [56]. Considering the above, outsourcing of operational activities has been introduced by ICMO to suffice the growing energy demand.

One of the primary objectives of ICMO is to enhance its internal exploration drilling operation to accomplish the expected target as mentioned in the 12th Five-year plan. Outsourcing of drilling operation by CMPDIL has increased from 0.07 lakh meter in 2007–2008 to 2.86 lakh meter in 2012–2013 over a period of five years that has further increased to 6.15 lakh meter in 2013–2014 showing a significant increase of 115%. For the year 2014–2015 the drilling operation has further increased to 8.28 lakh meter realized through departmental resources and outsourcing [57]. The estimated target for the year 2015–2016 has considerably increased to 15 lakh meter where the departmental capacity has been raised to 4 lakh meter and the rest through outsourcing [61]. According to the report, a total of 50 blocks involving 17.7 lakh meter of drilling was awarded since 2008–2009, however, drilling has been performed in only 24 blocks. The rest of the blocks are remaining non-functional because of reasons like local law and order problems and non-availability of forest clearance [61].

As reported, ECL, a coal producing subsidiary within ICMO, produced 141.73 lakh tons of coal and raised 587.91 lakh cubic meter of overburden (OB) from 27 outsourcing opencast patches in 2014–2015 that increased to 171.12 lakh tons of coal and 882.20 lakh cubic meter of OB in the year 2015–2016 from 31 outsourced opencast patches [62]. CCL, another subsidiary, has already outsourced several opencast mines and have been outsourcing a number of activities like OB removal, exploration, and monitoring of geological exploration. NCL has been planning to outsource OB removal along with departmental outsourcing which is within their 2015–2016 production program [63]. As reported, MCL has been also planning to outsource activities for the expansion of the opencast projects [64]. Further, it has been clearly stated by ICMO and MoC that they have already engaged an international agency for studying the mine operations in order to modernize the existing mines through the implementation of state-of-the-art technology [57].

## **5. Research issues and scope of work**

Thus, the above-stated facts emphasize the importance of outsourcing as a strategic decision of the organization in view of the improved organizational performances. However, while conducting the site visits and interacting with the company executives, the researcher discovered several lacunas related to the absence of strategic perspectives in regard to the outsourcing decisions of operational activities. It was observed that the decision of outsourcing is often taken in an aggressive manner with an emphasis on short-term cost advantage rather than giving due consideration in realizing the significant contribution of such decisions over the long-term competitiveness of the organization. Management of the company ought to have recognized the need to develop a logical step-wise approach towards

adopting outsourcing through a clear understanding of the contribution of each operational activity and its relation to organizational core competencies. Second, the need to analyse the appropriateness of the organization's outsourcing decision in the context of organizational strategy and its effect on organizational performance is another area of concern. There is absence of any performance evaluation framework for identification of the attributes (drivers) and their relative rank order for assessing organizational performance as a consequence of an outsourcing decision. In view of the advantages and short-term as well as long-term challenges, it may be worthwhile to develop a framework that can provide guidance to the practitioners faced with the dilemma of retaining activities in-house, or enter into outsourcing in a transactional manner, or to maintain an alliance relationship with the service provider. Last but not the least, one of the primary challenges of the organization is how to maintain an outsourcing arrangement with the service providers so that current competitive position along with a sustained business performance is maintained over an extended period of time. So, the identification of critical success factors for developing and maintaining a sustainable outsourcing relationship between the service provider and the client may be another area of research.

In this reference, it may be noted that apart from few studies conducted by the management consulting firms like the Indian Chamber of Commerce and Deloitte Consulting, there has been very limited studies on outsourcing for the coal mining organization specific to the Indian context. The existing literature does not adequately focus on the outsourcing decision support based on a strategic perspective that may facilitate the mining managers in outsourcing decision-making for the organizational activities. Adequate studies with a focus on the identification of key drivers for the assessment of organizational performance as a consequence of an outsourcing decision are limited in the extant literature. Studies on organization-level outsourcing decision strategies in the context of the coal mining organization in India have been rarely considered. Further, the literature on a structured approach that takes into account the sustainable relationship management aspect of the coal mining organization and its service providers in regard to the long-term competitiveness of the organization is also limited. Thus, reviewing the existing literature and considering the above-mentioned gaps, a comprehensive outsourcing



**Figure 2.**  
*The graphical representation of the outsourcing decision model.*

decision model has been formulated to address the salient issues emerged from the identified gaps as presented in **Figure 2**.

## **6. The outsourcing decision model**

### **6.1 Decision support to facilitate the outsourcing of organizational operational activities**

The study emphasizes on developing an outsourcing decision support to help management make a more informed decision on outsourcing of the operational activities. The decision support is in regard to the outsourcing decision of operational activities to be strategic rather than an aggressive one. Besides, defining the candidates for outsourcing, the decision support may contribute towards the identification of core, partial core, and non-core activities through a logical phased approach based on their contribution towards the organizational competencies. Thus, comprehending the contribution of each operational activity towards the organizational competencies allows the management to check for its strategic soundness and thus help in retaining the competitive position of the organization.

### **6.2 Identification of key drivers for evaluation of organizational performance on account of an outsourcing decision**

Outsourcing is considered to be one of the strategic options for organizations to improve their business performance. Determination of the unexplored attributes (drivers) and their comparative rank order for the assessment of organizational performance out of an outsourcing decision is another area of research to be taken into consideration [65]. The analysis comprising of both quantitative and qualitative attributes based on the cognition of the decision makers may contribute to a thorough understanding of a practical real-life problem and could help managers in long-term decision making. Understanding the effect of the unexplored attributes may also benefit management of the organization to develop policies in maintaining competitive advantage in the market.

### **6.3 Determination of optimal outsourcing strategy for the operational activities**

The outsourcing decision problem, also known as the make-buy decision of an organization is well-considered as one of the strategic decisions of any organization. The extant literature on the make-buy decision has been predominantly classified into two categories. The first one is related to the financial issues based on Transaction Cost Theory (TCT) whereas the second rests on strategic issues. There are several methods and approaches conferred in the earlier studies addressing such make-buy decision problems. The present study emphasizes on an organizational decision support to assess the optimal outsourcing strategy among insourcing (in-house), outsourcing (involving external service provider), and strategic alliance (partnership) relationship for operational activities of an organization [66].

### **6.4 Sustainable relationship management in view of the long-term competitiveness of the organization**

The focus is to identify the factors responsible for establishing and maintaining a sustainable relationship between the third-party service provider and the client organization. In this era of globalization, when service providers are value-adding

partners, trust, commitment, and long-term orientation are the key elements in maintaining a buyer–supplier relationship. Literature has witnessed a relationship characterized by such aforementioned traits not only help to better serve the customer but also intensifies mutual benefits. Investigation of relevant antecedents pertaining to trust, commitment, and long-term orientation have seldom been used in light of an on-going outsourcing relationship and are areas of concern.

## **7. Conclusion**

Outsourcing has been one of the noticeable business practices in view of its demonstrated capability in accomplishing competitive advantage to the organization. With the developing fame of outsourcing in the manufacturing and service sectors, mining sector have also started capitalizing the conceivable outcomes of outsourcing. Outsourcing has now turned into a key device for mining industries for building up corporate capability through its viable and effective methods of value improvement. In view of this business prospect, the coal mining organization of India has started outsourcing its operational activities to meet the escalating demand of coal across the country. However, along with several success stories, there are quite a few pieces of evidence that portray several difficulties encountered by the organization. Accordingly, to accomplish any firm's business goals, it is prudent to consider it as a key aspect of corporate decision choices.

The present study provides a general introduction about outsourcing followed by its potential benefits and the shortcomings as witnessed in the existing literature. Besides giving an overview, the study provides a backdrop of the Indian outsourcing scenario considering the coal mining organization and outsourced activities by manufacturing and service industries in general. The study then discusses the significant contribution of the coal mining organization in reference to the growing importance of coal in the country. Subsequently, the relevance of outsourcing in view of the improved organizational performances for the Indian coal mining organization has been elucidated. Finally, the chapter ends with proposing an outsourcing decision model that may provide a comprehensive approach towards evaluating the appropriateness of such strategic decision as outsourcing in consistent with the organizational strategy for performance improvement for the coal mining organization in India.

The present study contributes in understanding a practical problem of a coal mining industry that may act as a guiding instrument to the mining managers in terms of decision making related to strategic sourcing. Developing an outsourcing decision support may assist the managers of the coal mining organization to determine the candidates for outsourcing, thus identifying the set of core activities that needs to be nurtured and protected for organizational excellence. The study provides elementary guidance to the management in investigating the appropriateness of outsourcing with the organizational performance through identification of key drivers. Further an effective outsourcing decision support tool may help managers to decide upon the optimal sourcing strategy among insourcing, outsourcing, and strategic alliance (partnership) for the organization's operational activities. While the Indian coal mining organization is reliant on third party service providers for identification and exploration of new coal reserves, investigation of relevant antecedents pertaining to trust, commitment, and long-term orientation may facilitate management as client firm to develop and improve outsourcing relationship with the service providers. Determining the impact of the aforementioned factors may also help the mining executives to formulate relevant policies accordingly. However, there are few limitations of the present study. First, the study deals with the

development of an outsourcing decision-making framework broadly considering four aspects as presented. However, there are several possibilities to investigate an extensive set of decision elements within the said framework. Second, the outsourcing decision model proposed in the present study is based on the insights gained through the interaction with a particular expert group from the Indian coal mining organization, but to make it applicable for other industries, the framework may be altered/improved upon by incorporating changes as required. For a public sector like the Indian coal mining organization, it was difficult to obtain the various components of cost related to on-going outsourcing projects (particularly when many such projects are in either planning or finalization stage), the present study could not incorporate the influence of cost criteria and the required cost analysis for the proposed outsourcing decision framework. Hence, the current research work may be extended in future by incorporating several dimensions of cost. The study takes into account the client perspective, while it may be relevant to take into consideration the viewpoints of service providers to get a more comprehensive view.

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# The Viability of Outsourcing in Organisational Performance: Benefits and Risks

*Mário Franco, Margarida Rodrigues and Rui Silva*

## Abstract

Outsourcing is part of a system, as it includes products and services integrated in a value chain and which are performed by an external (contracted) firm, aiming to establish an interdependent, collaborative and trusting relationship between the contracting and contracted firms. Like any dimension of business in organisations, changes in organisational structures and in how the service is produced/ provided, outsourcing brings benefits and risks. Therefore, from literature review method, this chapter aims to explore the concept of outsourcing as a differentiating tool in organisations' performance, emphasising the benefits and risks. The results showed the dimensions to consider in the decision to implement outsourcing, which are: (1) transaction costs, (2) use of resources, and (3) collaboration between the parties. The contribution of the study is to present a synopsis of the outsourcing topic, specifically the theories that support it, its benefits and risks. Additionally, a decision-making model is presented, in the certainty of its usefulness for the organizations' managers.

**Keywords:** Outsourcing, organisational performance, theories, strategic decision

## 1. Introduction

The concept of outsourcing dates back to the 1940s (Second World War) and emerged in the United States of America (USA), given the war industry's need to concentrate on improving arms production in order to maintain the Allies' supremacy. This industry passed on some activities supporting production to other firms providing services [1]. However, only in the second half of the 20th century was the concept put into practice in the service sector, to stimulate organisations' profitability through sub-contracting services. These services cover low-value activities, such as cleaning and security, and others such as marketing, human resources, information technology and finance.

Here, Nunes [2] argued that outsourcing is a way to add value to business. In other words, outsourcing is a strategy to improve organisations' efficiency, through contracting specialised third parties to carry out some organisational functions [3]. Jacobs et al. [4] and Quélin and Duhamel [5] defined outsourcing as an operational change, involving transfers of suppliers. Barrett and Baldry [6] explained it is a process in which the user contracts a supplier to perform one of the organisation's internal functions and transfers assets (human resources and management responsibility) to this end.

Nevertheless, outsourcing is regularly confused with sub-contracting, given the close relationship, but the main strategic function of outsourcing is to ensure an organisation's profitability, through control of the financial area, human resources and information and technology, allowing efficiency and effective management of the available organisational resources by resorting to external sources to perform a certain area of business. This way of making organisations profitable has gained relevance, as an organisational tool, as a consequence of the opportunities and threats caused by globalisation.

Outsourcing allows the construction of better business, stronger economies and a more prosperous life-style [7]. Access to information, allied to technological innovation, lets organisations decide and act in a global scenario, creating interdependence and stimulating productivity and competitiveness, as argued by the same author. However, adopting it involves a decision, specifically one of the main decisions faced by organisations being the question of producing a given product/service or acquiring it through external entities - "make or buy" - where the focus is on gaining a competitive advantage over rivals [7, 8]. Therefore, outsourcing emerges as a strategic tool claiming to respond to current issues in the global economy [9], a real way to obtain a competitive advantage [10] and is an innovation in the service category, allied to the dynamics of core competences [11]. Recently, Ramasubbu et al. [12] concluded that the early studies on information systems controls considered only the projects developed internally by the organisations, currently, these go through external subcontracting, i.e., outsourcing, which include face-to-face and virtual teams, characterised by flexibility and agility.

Despite the growing number of organisations using outsourcing, not all achieve the expected results. So there must be a strategic focus to overcome the associated risks, since the success of any organisation is the fruit of its strategic orientation [13–15].

Regarding the theoretical framework, various theories support studies on the risks and benefits of outsourcing in industries and service providers. However, *"some of them are complementary, the others are contradictory. This creates confusion among the researchers of the outsourcing phenomenon"* ([8], p. 1). The following theories are highlighted: Transaction Cost Theory [16], Resource-Based View Theory [17] and Relational View Theory [18]. These theories and others will be addressed in the next sections dealing with the topics raised, because according to Perunović [8], this concept should be approached holistically.

In the vast literature on this topic, some gaps remain, which justifies this study. For example, research has been carried out on governance mechanisms [19] or explicitly relational mechanisms [20], but numerous studies have a limited reach due to using proof based on case studies [21] or on secondary data [22]. More recently, Hanafizadeh and Zareravasan [23] stated that more studies were necessary on the factors affecting decisions to use outsourcing. Moreover, in order to facilitate perception of organisational strategic processes, various researchers [24–27] studied the factors contributing to organisations choosing outsourcing. Also the decision between Insourcing and Outsourcing ("make or buy") has contributed to research aiming to understand the benefits and risks involved in that decision [28].

According to the dominant line of thought in the literature, in terms of organisational management, outsourcing can be considered a strategic tool that when correctly implemented allows a reduction in costs [29, 30] and optimised production [31], potentially giving organisations a competitive advantage [10, 32]. Therefore, this chapter aims to explore the concept of outsourcing as a differentiating tool in organisations' performance, to determine the viability of implementing this strategic tool, through the constructs of the benefits and risks associated with

the process of deciding between *make* and *buy*. This means that this chapter aims to present a synopsis of the outsourcing topic, specifically the theories that support it, its benefits and risks. Additionally, a decision-making model is presented, in the certainty of its usefulness for the organizations' managers.

## 2. Literature review

### 2.1 Brief synopsis

Organisations have been sub-contracting since the Industrial Revolution [3]. The managers of pioneering projects using outsourcing have left strong lessons: the importance of following an appropriate process in selecting suppliers and drawing up the contract; the importance of reaching an appropriate balance between the costs and benefits, understanding how the benefits can arise; the need for both parties to allocate their own resources to manage the relation and for new models to encourage both, and individual and organisational rewards in seeking success [33]; also showing that failure is always associated with responsibility [3].

Focused on the USA and the UK, the belief emerged that improved results were obtained based on solutions originating in competitive markets, such as the private sector [34]. For these authors, the focus was on reducing costs and better use of organisations' available resources, which in the public sector would imply a change in administrative processes, with hierarchical structures giving way to more flexible organisational structures, with growing concern about customers' needs, similarly to what happens in the private sector.

With outsourcing being a strategic tool, the decision to implement it should involve analysis of the set of levels forming an organisation, in tacit, strategic and operational terms [7]. This author also highlights that at a first level, corresponding to tacit relations, outsourcing was seen as a tool to solve organisational problems (lack of administrative competence, inappropriateness of human resources or lack of financial resources), where it was important to obtain better services involving less capital investment and less management time. Subsequently, outsourcing evolved to the strategic level, with maturing relationships, moving from a tacit tool to a management tool. Relations changed from seller and buyer to the formation of partnerships. External functions took on greater control in terms of responsibility, by directing attention to the strategic aspect. For Corbett [7], strategic outsourcing redefined organisations' essential competences, through forming long-term contracts and creating relations with suppliers, directed towards results. The last level concerns operational outsourcing, allowing managers to redefine the business. Value is found in the innovations that external sources can add to the organisation. It is also described as tool of leverage, allowing business changes in order to fit the global market, new customers and the need to introduce new products and/or services to the market [35]. According to Corbett [7], service providers are no longer seen only as means to obtain more efficient business, to be regarded as partners. As mentioned by Elmuti et al. [36], when an organisation opts for outsourcing to stimulate business, it should make a detailed strategic analysis to determine the benefits that can arise.

Elfring and Baven [37] identified the variables that can influence the choice of make or buy, in three groups: (1) strategic factors, including questions related to the main business, advantages and the specified quality; (2) environmental factors, which reflect the speed of technological development, exponential competitiveness in the supplier market and government regulations; and (3) operational factors, which are production costs and scale economy. To understand the emerging market,

Pitelis and Teece [38] suggested adding to these items the aspect of external coordination and learning.

## 2.2 Theoretical framework

Various theoretical streams in the economic sector address topics intrinsic to outsourcing, such as organisational cooperation and strategic planning. Studies on these theories absorbed theoretical aspects related to the benefits and risks arising from outsourcing. These approaches were summarised by Perunović [8] and are shown in **Table 1**.

The theories highlighted for the purpose of this study are: Transaction Cost Theory, Resource-Based View and Relational View Theory. Based on the theories explained above, there is literature that supports the outsourcing of companies [54, 55], whose decision is based on the need to boost economic efficiency, focus on strategy and greater business flexibility [56, 57].

## 2.3 Benefits of outsourcing

Theoretical study regarding the benefits of outsourcing relates to Transaction Cost Theory, created by Coase [58] and developed, many years later, by Williamson [59, 60].

For Coase [58], transaction costs are the results of the attempt to obtain market information, as the author assumes this process is intrinsic to each organisation, as well as negotiating and signing contracts, including in this case the costs associated with monitoring the clauses agreed. However, the most suitable concept was used by Arrow [61], in which transaction costs are seen as the costs related to the administrative aspect of the economic system.

Analysis of transaction costs can determine the best type of relation an organisation should adopt with respect to its market of operation. Therefore, the central focus of this theory is the costs associated with each transaction made by the organisation with the aim of obtaining profit. In the decision to adopt outsourcing, the organisation should consider transaction (operational and contractual) costs as well as internal (production) costs. If internal costs are greater than transaction costs, outsourcing will be the most viable solution for the organisation [62].

Theory	Author(s)
Transaction Cost Economics (TCE)	Brandes et al. [39]; Vining and Globerman [40]; Arnold [41]; Aubert et al. [42]; Barthélemy and Geyer [43]; Miranda and Kim [44]; Gottschalk and Solli-Saether [18]; Sahay, Halldórsson and Skjott-Larsen (2006) [45]; Barthélemy and Quélin [46]
Resource-Based View	Roy and Aubert [47]; Barthélemy and Geyer [43]; Gottschalk and Solli-Saether [18]; Barthélemy and Quélin [46]
Relational View	Willcocks and Choi [48]; Baden-Fuller and Hunt [49]; Barthélemy [50]; Gottschalk and Solli-Saether [51]; Sahay, Halldórsson & Skjott-Larsen [45]
Core Competences	Willcocks and Choi [48]; Brandes et al. [39]; Gottschalk and Solli-Saether [18]; Sahay, Halldórsson and Skjott-Larsen [45], Desai [52]
Agency Theory	Gottschalk and Solli-Saether [51]
Social-Exchange Theory	Whitten and Wakefield [53]; Sahay, Halldórsson and Skjott-Larsen [45]

*Source: Adapted from Perunović [8].*

**Table 1.**  
*Theories used in research on the outsourcing process.*

This theory suggests the option with the best cost–benefit ratio as being one of the decisive factors in the organisation’s decision-making process. When an organisation’s internal production presents excessive investment in obtaining the lowest unitary cost, it should turn to outsourcing. This argument was argued by Rockwell [63], when postulate that outsourcing helps organisations to minimise the cost of projects and save money.

However, as Transaction Cost Theory focuses above all on the organisation’s relation with the market in terms of costs, this was subject to criticism by some researchers. According to some authors, this theory ignored the role of differentiating capacities in the structuring of the organisational economy [64], neglecting power relations [65], trust and other forms of social insertion [66], as well as evolutionary considerations such as Knightian uncertainty and market processes. Transaction Cost Theory gave way to Resource-Based Theory.

Resource-Based Theory, proposed by Barney [67], considers the resources present in an organisation as a means to achieve its profitability and strategic advantage. The idea is based on the organisation holding a set of resources that can support its competitive advantage and lasting strategic performance. This theory highlights organisational resources and capacities as a source of competitive advantage [67].

With an identical theoretical reasoning to Resource-Based Theory is Knowledge-Based Theory [68], seen as an evolution of the former. Besides being studied based on the resources it holds, the organisation can also structure new resources efficiently. Here, organisational knowledge is seen as a factor stimulating performance in its functions, and can also be considered as a resource based on its characteristics and capacities. Therefore, both theories contribute to improving organisational performance, by stimulating competitive advantage, studying the capacity to manage the resources and knowledge available internally. When the necessary competences are lacking, an organisation should resort to outsourcing.

Managers have been increasingly perceiving that outsourcing allows them to accept more demanding contracts, since they have more capable human resources for this purpose, as they can access global resources [63]. In addition to the access to an increased range of resources, Berson [69] determined the reasons for firms implementing outsourcing, to increase their competitive advantage, these being: a) reduction and control of operational costs; b) management’s focus on essential activities; c) access to quality, global resources; d) freeing up internal resources for other purposes; e) obtaining resources that are not available internally. Bowers [70] also identified the basis for implementing outsourcing: the quality of services, which should be greater if obtained outside the organisation; cost reduction; diminishing the number of problems to be dealt with internally by the organisation (reducing the level of management complexity); access to knowledge about new technology; reduced expenditure on training (cost advantage); the use of global infrastructure; unlimited access to resources; access to better technical resources; guaranteed level of service; greater simplicity in daily operations (reducing the level of management complexity).

Finally, Relational View Theory, inspired by Cook [71] and based on the Resource-Based View of Barney [67], highlights the advantages of inter-organisational exchanges through forming collaborative relations such as franchising, strategic alliances or joint-ventures. This theory proposes that the more intense the relational exchange with partners, the more financial benefits can arise [72]. Implementation of these inter-organisational relations allows increased tacit knowledge, contributing to the organisation’s differentiation and consequently obtaining a competitive advantage. So outsourcing is seen as a flexible strategic tool, for increased response capacity and resource management, in order to respond to the present day’s technological and innovation needs. Besides access to the

organisation's internal and specialised capacities, this tool goes towards obtaining new resources, through reducing the need for capital.

## **2.4 Risks of outsourcing**

Although the idea of risk is broad and varies according to the area of knowledge studied, some authors seek to present a definition. For Kaplan and Garrick [73], risk is defined as a trilet (si, pi, ci), in which "si" represents the scenario, "pi" refers to the probability of that scenario occurring and "ci" involves its consequences. In this way, risk can be seen as the doubt about the seriousness of the consequences of a given activity or the result of the combination of the consequence and the associated uncertainty [74].

In Transaction Cost Theory, Williamson [59] considered that in any transaction there are elements that hinder its fulfilment, such as limited rationality, opportunism, the low number of negotiations and packaged information. Also in the presence of high asset specificity, uncertainty and low frequency, a careful analysis should be made, to avoid underestimating the total cost of the transaction, as this can be increased instead of the desired reduction [62].

In study of the risks involved in outsourcing, Agency Theory [75] is also highlighted. In this theory, two parties in the cooperative relation are involved in an association in which one of them, the "principal", delegates tasks and decisions to the "agent". Here, consideration must be given to factors such as the potential existence of a conflict of interests between the principal and the agent, the fact of each acting according to their interests, the existence of information gaps between the parties, the possibility of the principal being more prone to risk-taking than the agent and the principal's difficulty in monitoring the agent effectively and efficiently.

Given the similarities between Transaction Cost Theory and Agency Theory regarding the associated risks, four major risks related to outsourcing can be highlighted. The first is the principal's difficulty in leaving the relation without incurring losses and/or sacrifices in favour of the agent. The need to make changes to the contract can also be seen as a risk. There is also the risk of financial investment in resolving conflicts and risks associated with financial underestimation of transaction costs.

Relational View Theory, similarly to the benefits, is also related to the risks associated with outsourcing. As explained in Transaction Cost Theory, among the factors highlighted in terms of difficulty is opportunism which can enter the relations established, making it difficult for the parties involved to obtain a win-win relation [76]. Therefore, Relational View Theory explains how firms achieve and hold on to competitive advantage within inter-organisational relations [77]. Its key premise - the concept of relational rents - explains how firms choose their future externalisation partners and the preferred type of relation, which has an underlying risk [8].

One way of lessening the risks is approaching them through performance to select what should be subject to outsourcing, and this is divided in three dimensions [78]. The first is related to the strategic question associated with assessing the importance of owning or having good access to the process being examined. The second is related to the operational question, which seeks to define the levels of performance of the services to be outsourced and the levels currently achieved by the firm that will carry this out, avoiding unattainable expectations. The third dimension reflects the organisational dimension, in which the connection between the specific strategy of the processes and the business strategy is assessed [78].



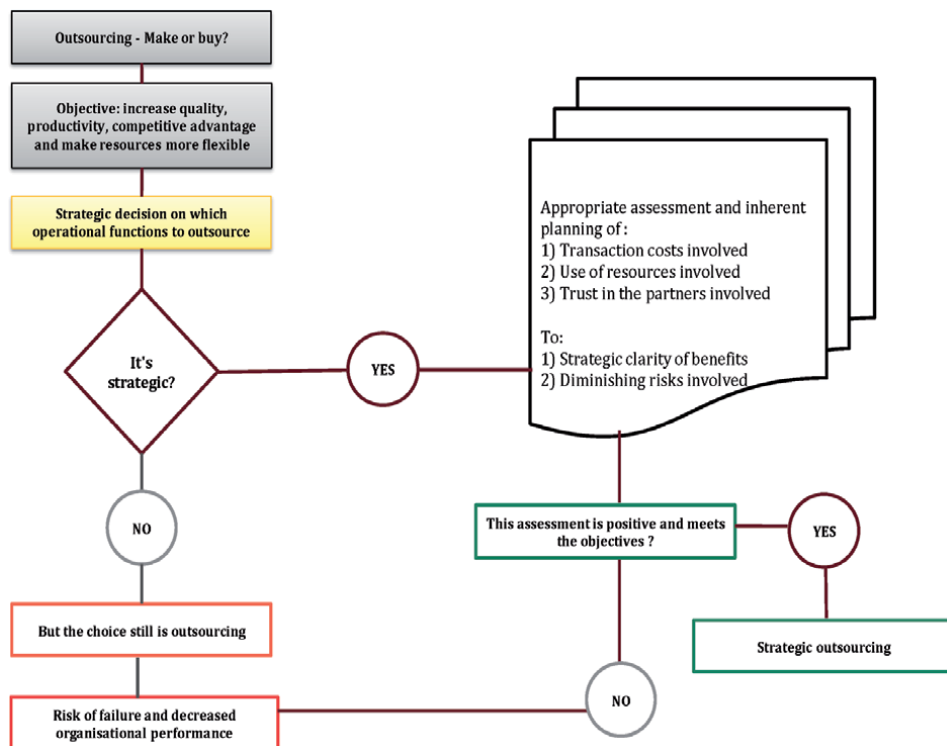
From another perspective, Barthélemy and Quélin [46] studied the negative results of implementing outsourcing. These authors examined 82 cases of implementation of outsourcing in Europe and the United States, describing seven fatal errors in outsourcing, which are: outsourcing activities that should not be in that category; wrong selection of the seller; a weak contract; aspects neglecting staff; loss of control over outsourced activities; neglecting the hidden costs of outsourcing; lack of planning of an exit strategy. The same authors argue that when the outsourcing strategy is well defined, there is a positive association with organisational performance.

In short, the decision on the use of outsourcing should take into account the associated risks, without neglecting that this strategic option aims at maximising benefits for organisations, specifically efficiency, profitability, organisational performance, sustainability, cost reduction and optimisation of available resources [79].

### 3. Proposal of a theoretical framework

The above sections explained that organisations opting to outsource some of their functions should formulate and plan a strategy that balances the benefits and the risks. Therefore, a theoretical model is proposed aiming to help the decision-making process about the viability of outsourcing, without putting organisational performance at risk.

The flowchart in **Figure 1** systematises an effective way to optimise the decision to place a firm's organisational functions in an outsourcing system. It also shows the



**Figure 1.**  
*Theoretical model.*

importance of this being a strategic decision, considering the risks and benefits, as well as transaction costs, resources and the typology and characteristics of partners. If this planning is effective, it allows correct determination of all the constructs included in the decision with positive impacts on quality, competitive advantage and maximisation of organisational performance. This means that *“the outsourcing decision not only impinges on the operational procedures of firms, but also affects claims against organisations and their future net cash flows”* ([80], p. 11).

This postulation is in line with the literature reviewed in the previous sections, given that we are talking about a decision of a strategic nature [9, 13, 30, 56, 79], which should be supported by an organisational policy of reducing current and future costs [29, 34, 62, 63], of an efficient allocation of available resources (internal and external) [7, 33, 63, 70]. No less important for the success of this externalisation is the improvement in the competitiveness of the organisations, provided that the determinants mentioned by Berson [69] are guaranteed.

In addition, this model uses as theoretical framework, the theory of transaction costs (cost reduction), the resource-based theory (efficient allocation of resources) and the Relational View Theory (efficient and effective partner relationships).

#### **4. Final considerations**

Outsourcing is beginning to be common practice in organisations, focusing on the softest organisational structures and in this way significantly reducing fixed structural costs, whether in production, service provision or human capital. However, choosing this instrument involves risks and uncertainties, since it involves transaction costs between the parties, important matters related to resources and assets, and efficient, trusting relations between the contracting and contracted firms. It is therefore essential to make a detailed analysis of these risks in parallel with the benefits arising from this type of partnership.

The literature presented here showed the importance of considering this strategic choice - outsourcing -, always bearing in mind that maximisation of organisational performance is a consequence of increased quality, productivity and competitive advantage in relation to rivals. If this is not taken into consideration, organisations that resort to outsourcing face the challenge of surviving in the global market, as they can enter a spiral of negative effects due to not having planned their decision strategically.

As with any study, this one is not without limitations. Firstly, the fact of being a descriptive study, and so it will be important in the future to make a systematic literature review through a bibliometric analysis, resorting to RStudio, for example. The second concerns the theories used, as many support outsourcing (e.g., knowledge-based theory, social-exchange theory, core competences theory).

Although not a recent topic in the literature, it will be interesting in the future to carry out empirical studies of the negative and positive effects of outsourcing on the organisational performance of those contracting. Study of why contracted entities fail is also suggested.

#### **Acknowledgements**

The authors are grateful to the anonymous referees of the book for their extremely useful suggestions to improve the quality of the paper. The authors gratefully acknowledge financial support from National Funds of the FCT – Portuguese Foundation for Science and Technology within the project “UIDB/04007/2020”.

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# The Evolution in Transport Operator's Corporate Structure: Ownership and Governance

*Dimitrios J. Dimitriou*

## Abstract

Outsourcing is wide used practice from large companies in the supply chain sector, especially, in transport industries, where world-wide the market deregulation is a continuing tendency towards cost control, service quality and emission mitigation. Many specialists and dedicated suppliers are already emerging with offers to take over parts of the transportation chain, while the booming of start-up companies promote a variety of data-driven applications towards operation efficiency, emission mitigation and revenues generation. Working capital and procurement cost could be more variable and transportation services are more on-demand response than ever in the past and by taken the benefits the digitalization era the shape of transportation business is changing fast, where non-transport revenues leverage by use of data are key driver of the transport companies' business strategy. The balance between insourcing and outsourcing activities are a key challenge for transport sector and this chapter highlights innovation and success factors for the transport industry taking into consideration the digital era wave and best practices, providing recommendations and guidelines to managers, planners and decision makers.

**Keywords:** transport enterprises corporate strategy, transportation activities outsourcing, managing outsourcing, assessment of outsourcing conditions

## 1. Introduction

Last decades, the transport industry experienced an essential demand growth corresponded with the e-commerce development and the socioeconomic (welfare) improvements, [1]. Key factor boosting transport sector growth is the deregulation of the transport sector business environment, have been adopted by most of the economies, where new business models have been introduced (e.g. Low Cost Carriers in aviation) generated new demand by providing connectivity to/from remote destinations and stimulated demand in mature markets, [2].

Transport network today, it is totally different compared to the past, where new entries provide additional capacity by new technology fleet, larger vehicles, expanding the transport network promoting connectivity in emerging markets and remote destinations. The existing business environment is highly competitive, especially, in mature international transports corridors (e.g. US-Europe), [3].

Alliances and acquisitions have been extended taken place in transport market promoting collaboration and risk-sharing schemes towards viability of large transport enterprises and market development by offer services even in niche markets served by new entries.

Traditional transport carriers were vertically organized, covering all the operational functions in-house, an approach usually drive to higher operational cost compared to those outsource activities not in the core of transport chain make them more competitive to a globalized market. The competitive liberalized business ecosystem in transport industry, where alliances and acquisitions are key strategies for the international and the multinational enterprises resulting a fast shifting from the traditional all-in structure towards a more outsourcing oriented approach.

While the transformation of traditional carriers is in place, focused on the main advantage of outsourcing that is the cost mitigation, a new framework for subcontracting is growing where the legal responsibilities and business risks are a key challenge for transport enterprises, [4]. Therefore, the condition of contracts is a complicated task for activities related to carrier's core values such as safety, quality of service and branding, [5]. In addition, the introduction of new digital services in sales, pricing, and communication with the client many times rise issues of intellectual property.

New entries in transport business have already establish flexible business models take the benefits of the era of digitalization and technological innovation. In mature markets, cause of rapid technology innovation in vehicles (type of fuels, energy consumption, automations etc.) and the effects of digitalization in offered services to clients (passengers or cargo), the tradition acting framework of a carrier is totally shift from a large work capital-intensive enterprise in early 90s to a more capital-intensive cooperation of today. Digitalization enables this transformation and promote new sources of revenues for the transportation companies and compromising the driving force for cost mitigation, for example, by optimizing the fleet operations (operational cost) and introducing customized services towards penetration in market segments.

In transport industry, the definition of outsourcing deals with the provision of an ongoing service even a business function for a meaningful time extended due to action lifecycle, such as fleet maintenance or rail line operation. Outsourcing not including deliverables from a specific one-off procurement process, service or deliverable, such as the construction of a building or a research project, [6].

This paper key objective deals with the depiction of outsourcing decision framework for the transport sector. Conventional wisdom is to investigate of the transport sector tendencies on keeping inside and outsource activities. The paper layout includes 4 sections, where the market tendencies in supply-delivering are highlighted, the outsourcing framework in transport business is described, aviation sector conditions are given presenting tendencies in the most outsource sector in transport industry, some key guidelines for managers are listed and finally the conclusion and reference section are situated.

## **2. Market tendencies towards supply-delivery outsourcing**

The decision-making framework to evaluate insourcing vs. outsourcing should be based on value analysis of each business function. Each function is weighted in terms of operational capability and the criticality to company objectives including corporate targets. In the analysis several parameters should be taken into consideration, depending on the size of the business, operational complexity of the transport-delivery chain and other factors related to financing, cost mitigation,

risk management and quality control. For enterprises deliver products, the different options could be categorized in three main directions: (a) leveraging internal staffing and technology; (b) outsourcing to a large third-party logistics (3PL) provider, or (c) implementing some combination of the two alternatives.

Leverage internal staffing and technology constitute crucial driver for outsourcing, especially, for companies or business formations that their supply and delivery process is not core of their expertise. Also, many companies organize in-house logistic activities simply because they do not have the scale or the complexity in their supply-delivery operations to warrant partnering with a large transport or/and logistic provider. With a fully in-house scenario, the transport and delivery functions maintain complete control over all aspects of their operations including negotiating carrier rates, planning, optimizing and contain deliveries.

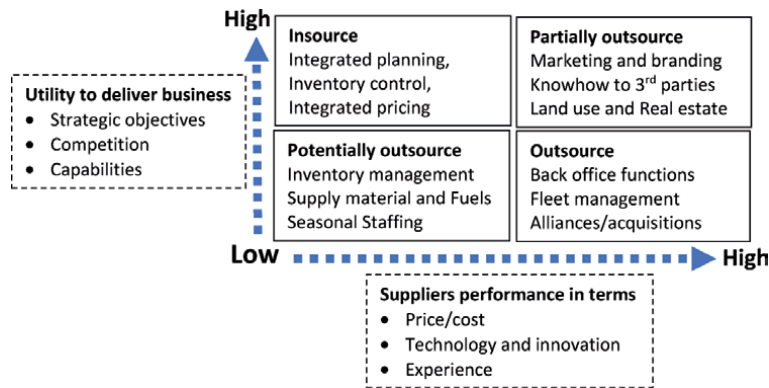
The challenge for transport enterprises is to reach the appropriate level of staff and fleet resources as well as the appropriate transport management capabilities in place. Benefits to the organization include full visibility of distribution process and outputs including a full control of costs at every step. Key challenge in this option is to define the balance between in-house and outsourcing vehicles and staff towards cost control and mitigation, and a step further to determine this balance in the short- and long-term business plan.

A key challenge for the companies for all business units in all business sectors deals with the decision to outsource all supply and production delivery operations to a large transport enterprise (3PL). This option for the companies with complex and/or larger-scale delivery operations, outsourcing all activities to a 3PL transport-logistic provider can be a optimum choice, provided adequate cost control to each product or service they offer. The biggest advantage to turning the supply-delivery function over to a 3PL provider is that transport enterprises have the knowhow in delivery management, use state of the art techniques and advance technology and they have the necessary human resources and fleet to serve the transport needs over time and on demand.

The downside of fully outsourcing to a 3PL is an option frequently led to a cost overhead, meaning that depending of the range of offered services it could result a higher direct cost for the distribution cost, but an significant cost reduction in relevant investments (capex) and in-house operational inefficiencies (opex). Negotiating the 3PL outsourcing contract should include detailed analysis on contract conditions and especially regarding monitoring expectations and performance, therefore, specifications on outsourcing services it's an area would be clearly stated.

In terms of risk management, many companies promote a combination approach, where some functions are outsourced, and some others managed in-house. In this option, they may choose to keep the functions related to corporate performance internally, such as the carrier rate negotiations, planning, and optimization of their own facilities and resources (staff and vehicles). They can then turn the execution of these orders over to the 3PL, which is a capability that all 3PLs must provide simply to remain competitive. This gives the chance to negotiate the strongest rates with their network of carriers and to also optimize how shipments move through the supply chain. They can take advantage of company exiting resources and use of knowhow and intelligence of a large transport provider.

Strategically, there is not a straightforward best option of those presented above. A comprehensive analysis should determine the appropriateness and effectiveness of each option for each enterprise or business unit over time. These analyses may produce differing results based on a company's varying operating geographies, production lines, market share, organizational objectives, and other factors (management obligations etc.). Also, many times the suitable of one year may not



**Figure 1.**  
Orientation towards outsourcing based on business value at risk in transport sector.

the same valuable for the next, therefore, it will be a periodically re-assessment process. These analyses must minimally consider short-term through longer-term impacts relative to costs, benefits, and risks from a financial, operational, organizational, and technological perspective.

Conclusively, in transport sector the strategy towards outsourcing should be based on utility function of the enterprise value chain. Globally, it's a strong tendency to outsource non-transport activities such is back-office support in a range of managerial oriented activities such as marketing, branding, IT, legal services and sectorial partnerships. On the other hand, an insourcing tendency for the cost driven functions such as procurement and fuel arrangements are the success factors towards pricing and profitability, where sometimes related to long-term contracts promoting advantages in competition. By investigation of key tendencies in transport business sector in Europe (research outputs from ENIRISST project, at the acknowledgement section details are given), the strategy orientation large transportation companies is depicted in the following figure (**Figure 1**).

### 3. Outsourcing frame in the transport industry

To date, many carriers have relinquished control of lower-value functions, such as payroll, human resources management or even slivers of the value chain that are more central to their business. Many shipping, aviation or truck carriers focus their strategy to lease vehicles or fleet for a time or season (e.g., holiday summer peak) even for many years (fleet lifecycle lease contracts), and many times these leasing contracts include the staff to operate vehicles. However, these same companies have seen little reason to let go of higher-value functions, especially, those related to managerial attitudes, such as fleet management, pricing, branding etc. as their scale has enabled them to develop world-class capabilities in-house.

On the other head the data driven business planning orientation is heavily affected the corporate business strategies. In a data-driven world, transport system operators' capabilities could be exceeded by those of their suppliers and this option may lead to greater efficiency and effectiveness, but it also comes with major risks associated with suppliers' power and independency. These risks should be handled carefully considering that an outsourcing arrangement that delivers gains in the short term could, over time, create mismanaged dependency, eroding competitive advantage, impacting corporate strategic targets and shareholder values. Transport companies cannot afford to be isolated from the digital ecosystem's innovation

(e.g. blockchain) forming around every industry, but each action must be carefully developed into the frame of outsourcing without giving away the power of the business to 3rd parties or suppliers.

The key factors that will determine which services are into the outsourcing frame deal with (a) if the outcomes can be clearly defined and provided by a 3rd party, and (b) the supplier's contractual conditions and obligations in terms of risk and benefits sharing mechanism. In a data-driven business actions, there are new dimensions to both, where key factor is the data control and maintenance but also the intellectual property for applications and deliverables.

### **3.1 Key dimensions of outsourcing**

Transport enterprises contemplating outsourcing a function with specific content, description and desired outcomes can be clearly defined and counterpart in a contract where the framework is developed by a collaborative agreement with a 3rd party where the risks and benefits are shared between the parties, and the progress monitored by the transport company. In other words, outsourcing dealing with a production chain task that is not traced by the transport company but for a third party (a supplier) that is fully or partially responsible for the product or function constantly evolved. In outsourcing cooperation, the contractor will commit time and resources but cannot generally guarantee a particular result and not taking transport business risks.

Hence, the key factors related to decisions for business performance, meaning the key managerial components of a company (such as the company accounting) and those actions related with the core business of transportation (such as fleet procurement or vehicle drivers) are hard to outsource, because deals with the key functions that the company specialized in the transport business ecosystem. In a high competitive business environment where agility is a key driver towards cost control and management performance, sometimes the concerns about outsourcing are essential in the terms of risk sharing and intellectual property. Therefore, the direction for spin-off business functions promoting joint ventures or gain-sharing agreements might be more suitable than an outsourcing contract when working with suppliers in this way.

Artificial intelligence is a great supporter of establishing such contracts, providing tools of monitoring and counting the contractor performance and outsourcing potential benefits. For instance, a product delivery company make it easier to assess performance of a delivery outsourcing contract in a region based on spatial (GIS) data analysis receive and storage data through sensors and tracking devices. In the cases that the outsource outcome could specified, defined, and monitored with accuracy, the more the company outsource these functions, the higher are the benefits of outsourcing.

Because the nature of transport distribution channels are to be developed in a non-interrupt operating networks, meaning that the performance in a small part of the network may affect the performance of the whole network, therefore, many times it is very trivial to estimate the added value of outsourcing in the company operational environment. This means that outsourcing may be better to include the component in supply chain it is more straightforward to define an outcome for a whole service, such as railroad line (see the case of London tube network) or bus network of a city (see the bus company in city of Nicosia in Cyprus), than for a small component of that services, such as railroad-track maintenance or just a single bus corridor. In such outsourcing contracts the level of offered activity or capacity is related to the whole performance quantified in the given spatial/geographical line, network, or region.

Key decision issue on the outsourcing content deals with the impact in the transport enterprise value chain. Therefore, many times the transport enterprises prefer more flexible options into the term of “Smart sourcing” is where the outsourcing solution combines the benefits of different suppliers to come up with the optimal solution. This option is in line with the strategy to keep control in the whole value chain and its widely used in aviation and shipping. Its compatible with alliances and merging strategies that are applied, extensively, in these sectors and the benefits for the company opex and branding are decision key drivers.

For the digital intelligent services, a similar type is widely applied, providing more flexibility to transport companies. The “niche sourcing” approach that its very close to above, but its more suitable for cases where no readily available “off-the-shelf” solution exists that fits an transport company particular needs. Smart or niche sourcing is quite often used in large transport infrastructure operators (ports, airports, logistic centers, etc) enabling an operator to combine the best technology with another supplier having a proven track record for managing IT infrastructure, service delivery, and customer service and project management.

### **3.2 Value at risk**

In a data-driven economy, where the high capitalized transport enterprises listed stock market (see sectors of shipping and aviation) valued much lower than the technological oriented enterprises with much lower capitalization, two other sources of advantage are particularly important towards data-driven services outsourcing. The supplier might have data and technology that the company would struggle to replicate, for instance access to a large data pool or a proprietary solution to finding dependencies between large data sets etc. Additionally, it might have skills and capabilities the transport enterprise cannot reach, or it is extremely costly to reach. With demand for people with big data skills outstripping supply, for example, outsourcing could be one of the few practical ways for a resources company to secure the talent required to develop algorithms for predictive maintenance.

When a technological supplier offers a structural advantage in low-value functions in transport supply value chain then the decision to outsource is not hard to be taken, as little value is at risk for the transport enterprise and the advantages could be easily assessed between the parties. But increasingly, suppliers may hold an advantage in functions deemed more critical to the business, such as data mining for the client’s profile or machine learning applications to predictive be, or in an area where, hitherto, the company has held a strong competitive advantage, such as safety, marketing, etc. or operational excellence towards customer satisfaction. In that case companies need to proceed much more cautiously when outsourcing.

The following figure presents how the companies in transportation prioritize their strategic advantages in their core business value chain, giving room for outsourcing. The results are based on reviewing the corporate strategy of large transport enterprises based on US and Europe.

### **3.3 Data driven economy encourage outsourcing**

The digital force for changes in the operational environment of a transport enterprise are essential. Consider an international carrier in air transport sector: it probably already has more data for their client/passenger than even and data mining applications, potentially, maintain their needs better and promote associated services (e.g. food beverage, entertainment, sales or accommodation). It might

make sense, therefore, for maintain the needs of client (passengers/cargo suppliers) to outsource the catering and other on-board services (e.g. entertainment for long-haul travel) rather than develop different menu for each destination or traveler choice and maintain catering in-house.

Large transport companies already employ external technology experts to track and improve the attractiveness of the offered service (resulting additional revenues) providing a better travel experience compared to competition (thus maintain market share) by using the Internet of Things (IoT). The issue is to aggregate the data from many different companies and introduce services and procedures meet the needs of a global market or even specific market segment. The result could be the development of a large group of new services dedicated for specific passenger profiles, where at the end of the day could be a new revenues generator for the company, and a step further to be tailor-made for passengers' profile, needs and habits.

Example is the transport enterprises for passengers, in which, while the main source of revenues because from transport activities in a few decades ago, to date is transformed to a new business model where significant source of revenues could be came from a platform with real time data for consumption in non-transport services or products and algorithms which support customers to spend for their travel needs (e.g. make reservations for a hotel or restaurant or event in the destination city/region).

As with the transport carrier, the insights that a platform operator would be able to generate revenues using these data could be far greater than those any single company could hope to uncover on its own. The prospect then arises of platform companies in unrelated areas, such as product sales, accommodation, banking, and healthcare, moving into the transport value chain. They recognize that companies accommodate passengers (potential clients) for a time is a key benefit for sales or promote services. Microsoft has already launched predictive-maintenance services enabled by the IoT, while a company such as Amazon could deliver a product bought on fly to the address you choose and a company like Google could give you optimum routing in a city or best travel option to intercontinental long-haul travel to an exotic holiday destination.

It is noteworthy that above-described actions are not driven just by the large IT or software or platform companies. The rapid development and introduction to market of new applications and the growing interest for funding start-up and small flexible enterprises provide significant advantages for the smaller ones, while in a useful idea at the right time could be extremely beneficial. Therefore, a small team could, for example, develop the optimum fleet-maintenance tailor-made to the actual needs of the company and to be as intellectual as those of the high branded manufacturing companies in their sector. Also, another group could develop the optimum network planning towards profit maximization or risk mitigation or both and just outsourcing management to a global supplier that can collate data from the hundreds of thousands of sensor-laden vehicles it manages to optimize the fleet's performance. While that were a future fiction in early 90s, today it is a common practice in Travel and Accommodation (T&A) sectors.

Typical example is the aviation industry where passenger's data used to be the core business for an airline or airport. A stream of transaction, tracking, monitoring and other functional data applications each passenger reservation, cargo shipment, or flight operation. Much of this data contains non-public personally identifiable information, especially in the PNR (passenger name record). Airlines also have volumes of proprietary and confidential information related to their business operations and IT assets. Moreover, much data is created in one country and follows a passenger or cargo shipment to its ultimate destination in another country,

while often transiting numerous other countries en-route. Outsourcing adds yet another layer of complexity, in that numerous third parties will need access to airline customer data.

Airlines need to ensure that their agreements with suppliers properly protect the confidentiality of airline and third-party trade secrets and limit the use of non-public proprietary information as required in all applicable jurisdictions. Restrictions on cross-border exchanges of non-public personal information, especially following the model of the European Union, are likely to make this process even more complex. Airlines also need to examine the extent to which data flows relating to money transfers and settlement functions have special money laundering and suspicious activity reporting requirements.

### **3.4 Outsourcing conditions**

Outsourcing suppliers are often perceived as “invisible” insiders or “remote” workers. From the view of top management, the confidentiality rules are crucial towards direct and honest cooperation, where a range of best practices are in place covering a range of conflict of interest during the outsourcing selection partner, non-disclosure legal terms in the contract due to prohibition and non-permission for delivering connected actions for a period after the contract termination. The non-disclosure agreements may not provide any relief against release of information by outsourcer employees, who may often be providing services to competing companies as well.

Offer services even into the company property using company assets many times are not covered by the same obligations and dissemination barriers as it happens for the company employees, and the coordination may be a tight task. Outsourcing arrangements must settle who will have access to company information and especially corporate and client’s data and under what circumstances will facilitate the use and access of such data in the outsourcing arrangement. Considering outsourcing arrangements effected in transport business ecosystem, the key considerations towards efficient outsourcing contracts could be summarized as follows.

- collaboration arrangements need to be based on cost-efficient and performance management schemes (e.g. bonus-malus), therefore, the price arrangements between parties should be flexible, involving from long-term payback assets to rapid development of technological innovations.
- medium-long term contracts is beneficial for the sectors of aviation, shipping and inland transports, while flexibility in innovation is the cornerstone of success for short to medium term contracts in urban transport networks.
- Smart sourcing and niche outsourcing arrangements, although focused, need to be integrated and include provisions dealing with relationship maintenance, substitution of parties to niche markets and partnerships in service customization and transaction services.
- Appropriate outsourcing arrangements should specifically address opportunities presented by joint ventures and alliance arrangements.
- Outsourcing agreements should clearly address who will have access to business confidential data, and under what circumstances, and provide enforceable confidentiality, non-disclosure even prohibit terms in appropriate jurisdictions.



#### **4. Outsourcing tendency in aviation**

The air transport industry has seen major changes in the post-deregulation era - almost 40 years after the airline deregulation first took off in the US and extended in Europe in '90s - primarily, because the Low-Cost Carrier (LCC) successful business model and the wide spread of hub-and-spoke networks resulting a dynamic airline industry, an incredibly competitive business ecosystem and a growing offering of capacity and services to the market, [7]. The hub-and-spoke networks enabled airlines not only provide the frame of synergies between the competitor carriers, but also to build partnerships more attractive as the spatial and temporal concentration of flights enabled efficient connectivity among the partners, [8].

The issue of "connectivity" is the cornerstone of modern air network planning and its strongly related to air transport productivity, airline efficiency and airport effectiveness, [3]. Today, the global business environment of aviation based on two main success factors: (a) the risk sharing mechanism between carriers, travelers, airports, and regional market [7]; and (b) the benefits achieved by outsourcing in internal (corporate and operational structure of aviation companies) and external business environment (extended through synergies, multilateral and globe-spanning air carrier alliances and joint ventures due to typical outsourcing contracts in catering and cleaning), [6, 7].

Outsourcing strategy for airlines, IT vendors, MROs (maintenance, repair and overhaul providers), more recent airports and other aviation-related businesses widely adopted many years ago. But last decade, the pace and scope of aviation outsourcing has significantly increased. For example, between 1985 and 1999, the 10 largest U.S. passenger airlines experienced a tenfold increase in their MRO outsourcing, representing more than \$2.4 billion a year in revenues to outsource suppliers, [9]. Airlines outsource many functions to help them focus on core activities, achieve efficiencies, and maintain competitive advantages. The outsourced functions include passenger or cargo reservations systems, accounting and traffic management systems, operational systems (flight operations, crew scheduling, gate operations, ground handling, catering), fleet maintenance, and office systems and functions.

Some of these outsourced functions relate to the use of long-life span assets, such as aircraft and airport facilities, which present airlines with duration issues related to how long the activity should be outsourced – for the life cycle of the asset or a lesser period. Many airlines in the U.S. and Europe historically have provided most of their airframe and engine MRO services inhouse (Delta, Lufthansa, British airways, etc). Today, airlines need to evaluate their outsourcing opportunities at all phases of an asset's life span.

Aviation industry is a leading sector using technology innovation and by taking the benefits of deregulation enforced in 80s in US and 90s in Europe, promote best business practices adopted or extended to other sectors. The introduction of the new type of fleet (more than 500 seats wide body aircrafts, e.g. A380), the growth of door-to-door airline integrators such as FedEx and UPS, the development of budget-oriented ticket pricing model (LCC), the public-private-partnerships in airport development and operation, have transformed the aviation industry. Today, successful business strategy is linked with efficient and flexible in terms of technological changes outsourcing be beneficial for all involved parties, while modeling and technological innovation based on mega data is fast transforming industry towards smart and intelligent business.

Airlines are keen to take the benefits of outsourcing, as a risk sharing mechanism, a cost control tool and brand extension strategy. Airlines strategy focused on branding. They acting to keep high branding strategy promoting collaboration with

world class enterprises in destination marketing, food and beverage and customized services. While in the past were followed a branding line extension strategy (by introducing additional products and services for each service under the airline brand), modern airlines are keen to adapt a brand extension strategy even an co-branding approach, by using their own brand or promote co-operation for services offered by world class suppliers. Therefore, a corporation with a famous food and beverage firm to provide on board meals are beneficial for both. On the other hand, fleet management, business intelligence and strategic alliances or bilateral corporations are the core of the modern airline and impact on branding (Figure 2).

The wide-ranging changes of the aviation market impact on the airport business environment as well. While airlines are change pioneer, airports also are following an essential transformation from a typical state authority of '90s accommodate air traffic to a private oriented company using the benefits of high passenger's and activities concentration in their territory, shifting airports not just as transportation hubs but also as large commercial centers and technological innovation units. While commercialization and privatization of airports are a continuing tendency around the world, supported by long-term investments and international cooperation's, these long-term life cycle arrangements boost outsourcing arrangements at airports towards operational efficiency, corporate performance, and socioeconomic effects in local economy, [1, 2].

The outsourcing strategy for airports dealing more to control working capital cost and provide low aeronautical charges to their clients that are airlines. On the other hand, the non-aeronautical business unities are key drivers for revenues at airports. Therefore, airport operators transformed to more commercialized entities, there is plenty room for more outsourcing in terminal and land side activities. The modern airport terminal is closer to a large shopping mall, while many logistics, commercial and technological centers are spatially located at airports landside area. Therefore, airport revenues strategy encouraging business competition into non-aeronautical business and tend to reduce the barriers to entry in aeronautical business sections, [4, 6] (Figure 3).

Furthermore, the innovation in air transport sector also including the development of drones and airspace services, are growing fast. Up to now, for commercial activities the drone enterprises provide dedicated services as alternatives of traditional transport modes. Drones enterprises acting mainly as transport service providers are taken full responsibility of the transport chain. However, it's a very

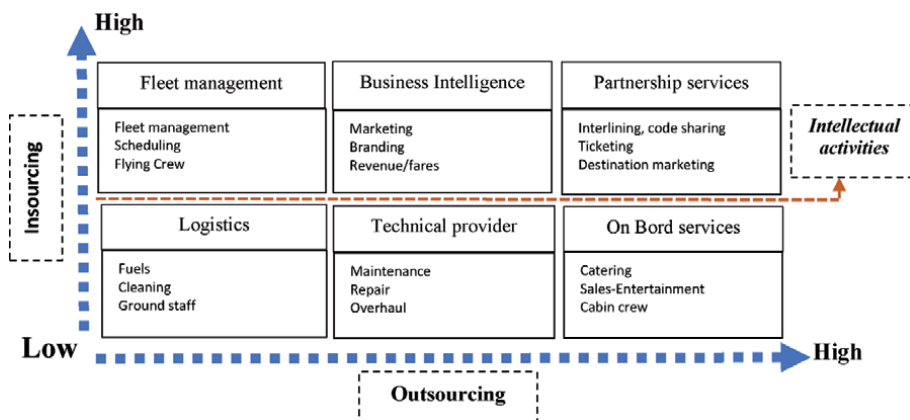
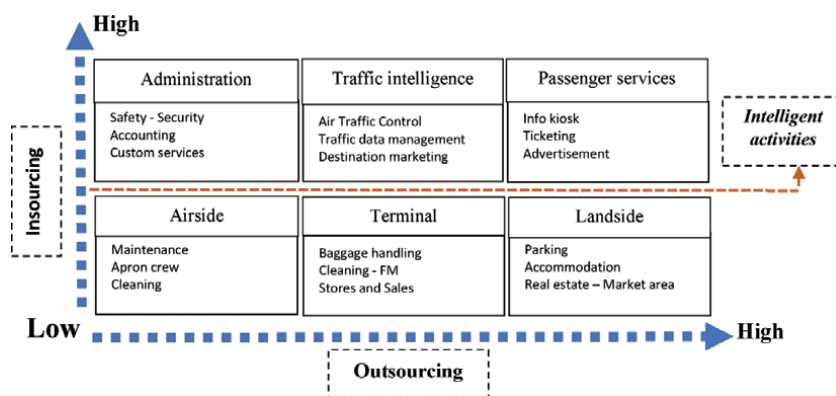


Figure 2. Outsourcing functions for a typical international air carrier.



**Figure 3.**  
 Outsourcing functions for a typical international airport.

promising activity with a strong tendency to offer massive services, in urban networks (taxis, urban logistics, etc) and interurban distribution channels (remote destinations, islands etc) where other options are limited.

## 5. Outsourcing ground rules for transport sector managers

The operational environment in distribution channels is changing fast. The operations of a large transport company could be optimized in weeks by comparing its performance data having access to the competition and supplier's data are uploaded in a database. In contrary, examples of extensive outsourcing of high-value functions are, for now, few and far between, with aviation and shipping be the pioneer sectors. In transport and logistics there is more room for outsourcing based on the market dynamics.

While considerable opportunities exist, transport enterprises need to prepare carefully and take into consideration a variety of strategic, business, operational and legal issues as well the key values of shareholders should be assessed towards deciding what functions or parts of function be beneficial to outsource. The key initials should be reviewed are:

- How to maintain flexibility when outsourcing a particular function or service that may change over the business life-cycle;
- For the high value functions the risk mitigation for smart source or niche-outsource should be carefully assessed;
- Compatibility with existing strategic alliances and partnerships should be analyzed;
- How to protect and manage the business sensitive data across competition and a tendency for outsourcing AI and IoT tools and applications and control the use of such data by third parties.

The key challenges for transport enterprise managers in a fast-changing industry and into the existing regulatory framework are highlighted in the following paragraphs.

### **5.1 Data control**

Companies need to guard against outsourcing arrangements or partnerships that prevent them from adopting new technologies or contracting with new vendors. Data management is a great value for a transport enterprise so it's a of great importance to control data produced by its activity. Those with the biggest and best databases will be those with the best models and predictive power, able to outcompete others. Giving away data increases dependency on suppliers increasing company value at risk. Hence, the data management system architecture so they can change with the times as new and unforeseen options emerge. Any outsourcing arrangement must be structured in a way that enables the architecture to be flexible, compatible, and open oriented. Key success factor for pioneers is the developed data driven business intelligent tools to help build outsourcing services, tools that are sold to competitors. Deep consideration should be given in conflict of interest, non-disclosure agreements, intellectual properties, and information shared procedures, as mentioned in above section.

### **5.2 Outsourcing condition of contracts should be flexible and incentive**

Both parties must share benefits and depending on nature of outsource service to share risks as well. Therefore, incentives should be the core of the collaboration frame and the outputs should be quantitated, determined, and monitored. Conventional wisdom is to agree in suitable incentives for an outsourcing arrangement to succeed. The usual ones—sharing gains and rewarding outcomes rather than inputs—are not extremely attractive in a digital age. But where outcomes are concerned, flexibility will be required. Eventually, it might be better to use another supplier to maintain competitive tension rather than to run existing outsourcing form of contacts. In business intelligence, hence, should avoid the deals that hinge on the use of proprietary or niche technology.

### **5.3 Risk control and assess value at risk**

The risks of outsourcing to a single, dominant supplier might not be obvious initially, as digitization reduces the barriers to entry, prompting a proliferation of new players, all rushing to capture value and competing strongly. The risk of losing leverage over a supplier through a lack of credible competition is therefore significant. In addition, becoming too entrenched with a single supplier can make switching costs high, as many companies have found with enterprise-resource-planning systems. To help maintain a healthy level of competition, large companies spread even the same function of an activity among several suppliers and nurture smaller ones, although this does not come without a cost either. In a provocative sense, even the outsourcing for a large network in a city or region to a single supplier may the risks are significant lower to choose two or more suppliers to commit competition.

### **5.4 Negotiating outsourcing contract**

When negotiating, both suppliers and transport enterprises should consider clauses providing for asset substitution, upgrading, and modification, intellectual property and know-how issues along with adjustments in pricing and penalties. A clear “objective” for both parties along with clear and dedicate benefits-risk sharing mechanisms to maintain technological change should be considered.

## **6. Concluding remarks**

In transport sector, outsourcing can be extremely beneficial, productive even crucial to capture the potential of new technologies and innovation capabilities. Decisions to outsource for some companies' might base on buy time to build their own skills and capabilities or gain cooperation with technological driver of innovation, while smaller ones might outsource to leverage the capabilities of new suppliers. Ultimately, when up against increasingly smart and capable suppliers, many companies might have to rethink their core business. But in the meantime, they need to be highly strategic in their decisions about what or how to outsource.

With time, technology will undoubtedly break up the traditional value chain in the transport business ecosystem as companies are forced to conclude they enjoy a competitive advantage in far fewer functions than they do today. Eventually, they might be able to outsource entire parts of their business or major factions impact essential their value chain. Transport enterprises have to take the benefits of artificial intelligence and business intelligence as well. The outsourcing of research and development activities, especially, in the data management is on the top of the agenda even for the large companies.

The future impact of technology remains far too unclear. Very few years ago, for example, few businesses knew how important cloud data management would become. Open technology standards will be key to maintaining future strategic options towards outsourcing data retrieve services. While support might be sought for the execution of a technology strategy, decisions about what data to keep, where to store and process them, and how applications can access and manipulate them need to be made by the company. What companies should follow to ensure the capture of the short-term gains that outsourcing can deliver in a way that does not limit their future strategic options.

The paper outputs depict the results of a functional analysis for the transport enterprises, driven from the research outputs of ENIRISST program where transport intelligent application taken into consideration. The paper outputs given according to a System of System approach providing the changes on transport sector towards outsourcing and co-branding strategy. An area of further research could be this analysis to be extended for each sector of transport industry and to provide results in term of enterprise size, sector and market segment.

## **Acknowledgements**

The paper use research outputs from the research project "ENIRISST – Intelligent Research Infrastructure for Shipping, Supply Chain, Transport and Logistics", implemented in the Action "Reinforcement of the Research and Innovation Infrastructure", funded by the Operational Programme "Competitiveness, Entrepreneurship and Innovation" (NSRF 2014-2020) and co-financed by Greece and the European Regional Development Fund. EN.I.R.I.S.S.T. is a unique and pioneering research infrastructure deals with the development of innovative techniques, AI and BI applications, and digital observatories in the fields of Shipping, Supply Chain and Transport (<https://www.enirisst.gr/>).

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# Entry-Mode Selection and Firm's Productivity across Market Destinations: An Empirical Investigation

*Rosa Capolupo and Vito Amendolagine*

## Abstract

This work aims at investigating the productivity premia of three alternative modes of internationalization for a panel of Italian manufacturing firms: FDI, international outsourcing, and exporting. By using simple regression tests we try to investigate whether and to what extent these modes of firm's entry into the foreign markets increase the productivity of firms at home. Surprisingly, our findings show that firms that self-select in engaging in exporting have the greatest productivity gains. The findings hold true even when we extend the analysis to geographical country penetrations.

**Keywords:** international trade, offshoring, FDI, productivity

## 1. Introduction

A critical issue for firms that operate in a globalized world is the choice of the best entry mode to service international markets. The selection of the best strategy is of pivotal importance because of its impact on firm's performance. The options available to firms have extended in recent years and the two most widely options - represented by exporting and foreign direct investment (FDI) - have become wider. The additional mode that we consider in this paper is the activity of fragmenting part of the production abroad either by international outsourcing (arm's length trade) or vertical foreign direct investment (FDI) in which all or parts of production is relocated to another country to affiliated firms. According to the literature, we define this entry mode as offshoring whose purpose is either accessing resources or a response to intensification of competitive pressures from abroad. Increasingly, it represents the internationalization mode that occurred most frequently in the last decades. This move is not only confined to cost saving activities but includes the reallocation of tasks and activities of the entire value chain.

The vast majority of Italian companies that choose to move their production facilities to foreign countries takes away also intangible capital and skills that have made famous the Made in Italy. The main reason is to reduce labour costs. The average salary in the South Eastern Europe - the geographical area where many Italian firms have offshored productions - is about three times less than the average wage in Italy. But the level of wages is not the only advantage to move production

abroad: even tax conditions, less bureaucracy, a favorable regulatory environment are attractive factors for entrepreneurs. For these reasons, a large number of Italian companies has moved in that area 17,700 businesses [1].

All the internationalization choices require different levels of resource commitment: exporting is a low resource-commitment and a low risk entry-mode, whereas FDI and offshoring are associated with greater risks, higher fixed costs and organizational complexities. Thereby, the returns expected by these entry modes are higher for FDI and offshore-outsourcing and lower for exporting firms.

As reported by Greenaway and Kneller in their review article [2], the bulk of the empirical literature does not study simultaneously the productivity performances of all these different international choices but investigates separately firm performance for exporters against non-exporters, offshorers against non-offshorers and MNEs against some other form of internationalization, generally exporting. There are still few studies that put together all these different forms of foreign activity to bettering our understanding of the structure of foreign trade, characterized by a growing role of multinationals and a growing share of intermediate inputs in trade flows. The objective of this work is to assess the productivity performances of firms that undertake different overseas market-entry strategies.

Seminal works in international trade literature state that the entry modes of firms in international markets is endogenous and depends on ex-ante firm's productivity. From a theoretical point of view, the model that compares different entry-modes in international markets is that by Helpman et al. [3]. This model, adding heterogeneity across firms in the same industry shows that firms self-select their entry-mode (exports versus FDI) according to productivity levels of firms. This is done through a sequence of different fixed and sunk costs associated with the various forms of internationalization. In their model the choice to serve foreign markets is associated with different fixed and variable costs, which have important consequences for firm's strategy to enter into foreign markets. The fixed costs of Horizontal-FDI (HFDI) are greater than those of exporting. Since only the most productive firms can afford the duplications costs in establishing new plants in a foreign country, the main prediction of the model is that FDI firms are more productive than exporting ones.

This theoretical prediction is generally supported by a fairly extensive empirical literature. Studies by Bernard and Jensen [4] and Yeaple [5] confirm that U.S. firms with the lowest productivity stay domestic, those with higher productivity export, and those with the highest productivity invest abroad. Further validations come from UK firms [6], Irish firms [7], German firms [8, 9]. Other studies conducted on Japanese firms such as Tomiura [10], and Kimura and Kiyota [11], also confirm the sorting pattern of internationalization with respect to productivity. However, the HMY model refers only to the standard moves (exports versus FDI) but some of these empirical papers have extended the predicted ranking by including also offshoring.

More recently, Wakasugi [12] in his study on Japanese firms finds only a partial validation of the HMY predictions. The novelty in his study is the distinction among different destinations of the foreign activity of the Japanese firms. While the result is consistent with the HMY sorting of export and FDI in the case of USA and EU destinations, the reverse order holds in the case of Asian country destinations. This suggests that dissecting exports and/or the investment modes by producers in different foreign markets might be crucial to assess the validity of the predicted theoretical ranking. Many other studies have distinguished foreign activities by destination countries but in that case the analysis was directed only to exporting activity (i.e. [13–15], De Loecker [16] among others).

Following this literature, we use a database for a large sample of Italian manufacturing firms, which include both large and small-medium sized enterprises, to test different international entry-modes as well as the decision to stay domestic. The first move is horizontal foreign direct investment, the second move is offshoring and the third is exporting. More specifically, we test whether companies that choose horizontal FDI show a higher performance compared to offshoring firms and whether the latter outperforms, in terms of productivity, exporting firms. In turn, we test whether exporting firms outperforms purely domestic firms. Finally, we test whether the findings are consistent across different destinations of foreign activities. Our main measure of performance is Total Factor Productivity (TFP).

This paper contributes to the literature on market entry modes. Firstly, it adds a piece of evidence on the internationalization moves and their impact on firm's performances by investigating Italian firms. There are a number of research contributions that investigate the outcomes of entry-modes for individual countries by providing mixed results.

Secondly, it uses a dataset that enables to separate firms' strategies according to destination countries in order to evaluate whether the ranking holds when firms' productivity varies across destinations.

Thirdly, in contrast to previous literature, our finding is that for Italy the best performers in international markets are exporting firms.

The remind of the paper is organized as follows. Section 2, briefly review the literature on entry-modes. Section 3 describes the data and present some preliminary descriptive statistics by taking special care at identifying the different strategies of internationalization in our data set. Section 4 reports the main findings of our tests. The last section summarizes and draws some conclusions.

## **2. Related theoretical literature**

In this section we recall some contributions of the literature to delineate the analytical context of our research. Prior of the HMY paper, other theoretical models have tried to incorporate the profound transformations that we observe empirically in the international context by incorporating sunk costs, heterogeneity, and uncertainty in dynamic models. This line of research, how rightly pointed out by James Tybout [17], dates from the late '80s. Recently, however, many interesting papers have been published that extend the literature on international choices of companies on the basis of a set of new stylized facts. The new approach to the analysis of cross-border trade and foreign investment has been developed in the canonical paper by Melitz [18], Bernard et al. [19], Antràs [20], Antràs and Helpman [21] and Helpman, Melitz and Yeaple [3] among others. These models, focusing on individual firm behaviour and participation in international markets, offer an explanation of why some companies stay in house while others go overseas as well as to the puzzle of international fragmentation of production. One of the most remarkable features of globalization and accelerated competition is that the reduction of transportation and communication costs have contributed to boost international trade and has pushed firms to find new ways of value creation. Among the motives for choosing different foreign strategies, the degree of heterogeneity within industries emerges as a result of productivity differentials across firms. What comes out from this literature is that the interaction of sunk costs and productivity heterogeneity is the key motive to explain the choices of globalized firms. The international strategies of corporations of exporting or investing abroad should depend on productivity cutoffs that make these different modes of internationalization profitable.

Indeed, Krugman [22] developed a model, (successively tested by [23]), in which firms trade-off proximity to consumers (FDI) against the scale economies achieved by production concentration in one location for export. The HMY model introduces firm-level heterogeneity to confirm the prediction of the proximity-concentration trade-off thus allowing this trade-off choice to differ across firms within the same industry through the assumption of different costs associated with serving the foreign markets. Firms tend to substitute FDI sales for exports when transport costs are high and plant-level returns to scale are low. But because of the higher fixed costs of FDI, this choice will be made only if the profit curve for subsidiary sales is steeper than that of exporting. More precisely, their results show the presence of a productivity cutoff which is a function of industry and destination country characteristics: firms with productivity below this cutoff export, whereas firms with productivity above the cutoff invest abroad. In addition, since foreign investors and exporters coexist in the same industry, it is possible to calculate the Export/FDI ratio by aggregating all firms in the same industry with productivities above their correspondent cutoffs and this ratio will be lower the larger the variable trade costs and viceversa. The main findings are embodied in the following sequences of outward orientation by firms: (i) the most productive firms serve foreign markets via subsidiary sales, (ii) intermediate productivity firms cover foreign markets through exports and (iii) lowest productivity firms serve only the domestic market.

The predictions of the HMY model have been confirmed by the empirical analysis conducted by the same authors. Using US export and affiliate sales data that cover 52 manufacturing sectors and 38 countries they show that cross-sectoral differences in firm heterogeneity predict the composition of trade and investment in analogy with the theoretical model. The research focus of our empirical analysis is to explore not just the decision to serve foreign markets through export and horizontal FDI but also vertical foreign investment decisions motivated by factor (labour) costs advantages. As pointed out by Antràs and Helpman [21] the model of HMY does not address the organizational choice of firms that need to purchase intermediate inputs, which is one of the most important form of international trade in the last decades.

There exists numerous studies in the international business literature that investigate the selection of these entry-modes. However, the research is fragmented and the issue of the link between selection of entry strategies and performances is limited or at least it is not posed in the perspective so far outlined. Also in this literature the two most widely options are exporting and FDI but the majority of studies investigated the determinants of the two choices. The approach followed is an incremental one: firms initially choose exporting and only after gaining experience in the host country may expand their operations through ownership of production [24, 25]. While FDI research focuses on the OLI framework of Dunning [26–28], which is expected to explain the majority of international strategy selection, export research relies instead on transaction costs theory (TCT), which provides valuable insights on how firms organize their activity abroad to increase their efficiency by selecting export channels [29]. Other recent approaches build on the research-based view and institutional theory to explain how firms can improve export performance by considering not only export channels but also the performance consequences of learning capabilities [30, 31]. More specifically, recent contributions by He et al. on exporting choice suggest that market orientation capabilities of firms, that is the effort to create value in the export market, is important to link export channel selection and export performance. These capabilities are not considered in the TCT but are crucial to assess exporter's performance. Indeed, capabilities help firm to learn about foreign markets and adjust “strategy and products to conform to market demand, which should result in superior export performance” (p.30)

A different strand of the same literature has investigated offshoring performance in isolation with respect to the other entry-modes by looking at different aspects of performance such as corporate financial performance, cost saving, sales growth etc. [32–34], among many others) as well as general characteristics of the offshoring strategy [35]. However, also in the business practice the decisions of firms' internationalization are not taken in isolation, thus a joint analysis of entry strategies is conducive to a better understanding of the phenomenon. Our perspective is to compare the different productivity performances of all the three entry modes taken together, without investigating the determinants of these choices. The purpose is to stimulate a more intensive discussion that takes into account theoretical advances from different strands of literature.

Therefore, entering offshoring in our analysis, Italian firms that decide to sell goods overseas have three options: (i) producing at home and export (ii) fragmenting production such that producing and selling of goods may occur in one or more different locations abroad (offshoring), (iii) opening up an affiliate in the destination market and produce and sell goods in that location (horizontal FDI).<sup>1</sup>

### **3. Data description and productivity measures**

Our firm-level data are drawn from the IX and X waves of the three-year Survey on Manufacturing Firms (Indagine sulle Imprese Manifatturiere) administered by the commercial bank Capitalia-Unicredit. The surveys used cover the period 2001-2006 and was conducted in 2004 and 2007. These surveys report, through stratified samples by geographical areas, and industrial sectors several aspects of selected units with employees between 11 and 500 and a census of firms with more than 500 workers. Information is collected through questionnaires as well as quantitative data from firm's balance sheets for all the years covered by the Survey, regarding factor inputs, output, value added, and all data details necessary to our analysis. More importantly from the firm's interviews, we collected a rich set of information on different types of international engagements by Italian firms.

For our purpose, we pool together the two waves, adding the panel units to the non-panel components from the second survey for an entire sample of more than 4000 Italian manufacturing firms. In the cleaning process, we exclude observations revealing a value added, or capital stock or materials that are negative or missing for more than two years (or, alternatively, in the central year) over each three-year wave. Moreover, we consider as outliers firms where measures of value added or inputs (i.e. capital stock, the number of employee), over each wave's period fell within either the first or the last percentiles.

Namely, for our empirical analysis, we consider as a first category companies that perform horizontal FDI aimed at producing goods that will be sold into foreign countries. For this scope, in order to define horizontal FDI, we use the following questions:

- i. Within the three-year period (2001-2003 or 2004-2006), did the company make any FDI?
- ii. Share of foreign production by destination: (a) sold in the place where the company was settled, (b) sold to third countries.

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<sup>1</sup> As in Helpman [36] with the term offshoring “we refer to the sourcing of good or service in a foreign country, either from an affiliated or an affiliated supplier (p. 127).”

As a second type we include firms doing offshoring activities, that are those investments aimed at moving abroad the production of semi-finished goods or components, which are going to be re-imported into the domestic country and then either sold into the domestic country, or re-exported abroad or re-introduced into the domestic production.<sup>2</sup> The definition of offshoring relies on the following questions:

- i. Did the company move abroad the production of semi-finished goods or components.
- ii. Share of foreign production by destination: (a) re-imported into the domestic market, (b) re-exported abroad; (c) re-introduced into the domestic production.

We include in the analysis also offshoring in services which relies on the following questions:

- i. Did the company buy services from abroad?
- ii. Share of foreign production by destination: (a) re-imported into the domestic market, (b) re-exported abroad, (c) re-introduced into the domestic production.

The third category involves firms doing only exporting. In the internationalization part of the survey, firms answer at the following questions: (1) has the firm exported all or part of its output in the last year of the survey? (2) What is for each firm the percentage of its exports on total sales? Firms are asked to indicate the geographical area of destination as percentage sales exported for each destination, so that the total should be 100%. The nine geographical areas are EU (15), New Entrants in the EU in 2004, Russia, Turkey and other EU countries, Africa, Asia, China, Usa-Canada and Mexico, Latin America, Australia.

Finally, we take domestic firms, that are those that do not export and offshore either. Unfortunately, for Italy, these forms of internationalization do not fit exactly in the categories just described. In our data set, while there are pure exporters, there are not purely horizontal FDI and only a small number of firms are purely offshorers.

To compute an approximate TFP we follow Tomiura [10] using the following approximation formula:

$$TFP_{it} = \log\left(\frac{Sales_{it}}{L_{it}}\right) - \frac{1}{3}\log\left(\frac{K_{it}}{L_{it}}\right) \quad (1)$$

This measure adjusts labour productivity by a fraction (in this case (1/3) of the capital intensity). As noted by Head and Ries [37] the drawback to this measure of productivity is that it reflects both technical efficiency as well as economies of

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<sup>2</sup> Our measure of offshoring firms includes both international outsourcing (arm's length trade), in which one company hires an overseas firm to complete a function that was previously performed in-house and offshoring FDI (or intra-firm trade) that is the multinational tendency to fragment part of production to low wage countries. In other terms, we follow the recent classification of offshoring that includes all international relations without distinguishing whether the provider is external or affiliated within the firm. The identification of offshoring firms in this broad sense has been made by looking at the section devoted to overseas production relocation in the cited Survey and reported in the Appendix.

scale. However, it is a good measure of technical efficiency if there are constant returns to scale and 1/3 is a reasonable measure of the capital share. The fraction of 1/3 has been used also by Hall and Jones [38] and roughly corresponds to physical capital intensity in manufacturing. On the other hand, using the ordinary least square method to calculate TFP as a residual would likely produce biased coefficient estimates due to correlations between the exogenous variables and the error term.

In the following we report some descriptive statistics on the whole universe of firms in our dataset.

As revealed by **Table 1**, across all destinations, firms performing only export are far more numerous than firms moving production abroad. Furthermore, among the latter group, the percentage of companies making offshoring (in materials) is larger than firms performing horizontal FDI. Over time, international activity seems to decrease from the triennial period 2001-2003 to the period 2004-2006. When we distinguish by destination of international activities, we first observe that the percentage of exporters to Southern destinations is larger than that of exporters to Northern destinations. Secondly, for investors, Southern destinations result to be preferred to Northern destinations in the period 2001-2003, but the opposite turns out to be true in the second period (2004-2006). Finally, investors to the North reduce their horizontal FDI and increase offshoring activities over time.

The **Table 2** shows the number of firms across industries distinguished by their international strategies.

Given the limited number of firms that invest abroad in some sectors, we aggregated the firms in 9 sectors. The strategies have been labeled as following: Horizontal FDI (HFDI), offshorers (OFF), Exports (EX) and Domestic (D). What emerges from the table is that the majority of firms across sectors decides to export while the percentage of firms that invest abroad chooses to do it by doing offshoring and only a small percentage of firms perform horizontal FDI. In particular, industries more involved into offshoring are Leather, Wood, Paper Products, Medical Apparels and Instruments and, at a lesser extent, Furniture, Printing

Year All destinations (%)	2003	2006
HFDI	1,25	0,27
OFF	1,76	0.83
EXP	71.82	60,9
Northern destinations (%) <sup>2</sup>		
HFDI	0.24	0.14
OFF	0.11	0.23
EXP	65.71	†56.7
Southern destinations (%)		
HFDI	0.79	0.05
OFF	0.62	0.16
EXP	71.82	60.9
N. Obs.	3683	4443

<sup>1</sup>HFDI= horizontal FDI; OFF=arm's lenght trade and vertical FDI; E=only exporters D=domestic firms (in the next table).

<sup>2</sup>Note that not all the companies in the dataset reveal the destination of their foreign investment. Thus, they are not counted in the statistics concerning specific destinations.

**Table 1.**  
 Distribution of different internationalization modes across destinations.<sup>1</sup>

Category	Year	DistributiOn (%)				N. firms
		HFDI	OFF	EX	D	
1.Food & Beverages,	2003	0.0	0.25	67.75	32.0	400
Textiles, Clothing	2006	0.27	0.0	55.38	44.35	372
2. Leather, Wood,	2003	1.23	5.62	75.57	17.93	569
Paper products	2006	0.51	1.86	69.93	27.87	592
3.Printing & Publishing,	2003	0.68	2.05	58.56	39.38	292
Petroleum Products & Chemicals	2006	0.0	0.24	38.59	61.17	412
4.Rubber & Plastics,	2003	0.96	0.48	76.50	22.06	417
Non-metal minerals, Metals	2006	0.46	0.70	65.20	33.64	431
5. Metal Products	2003	1.05	0.35	61.24	37.35	854
	2006	0.09	0.43	50.51	33.64	1,166
6. Nonelectric Machinery, Office Equipment &	2003	22.45	1.51	85.69	10.73	531
Computers, Electric Machinery, Electronic Mat.	2006	0.29	0.73	77.71	48.97	682
7. Medical Apparel & Instruments,	2003	2.11	3.17	73.94	21.13	284
Vehicles	2006	0.53	0.80	60.90	38.03	376
8- Other Transportation	2003	2.25	1.12	68.54	28.03	89
	2006	0.0	0.88	72.81	26.32	114
9.Furniture	2003	1.21	1.21	83.0	14.98	247
	2006	0.34	2.68	72.15	25.17	298

**Table 2.**  
*Distribution of different internationalization modes across industries.*

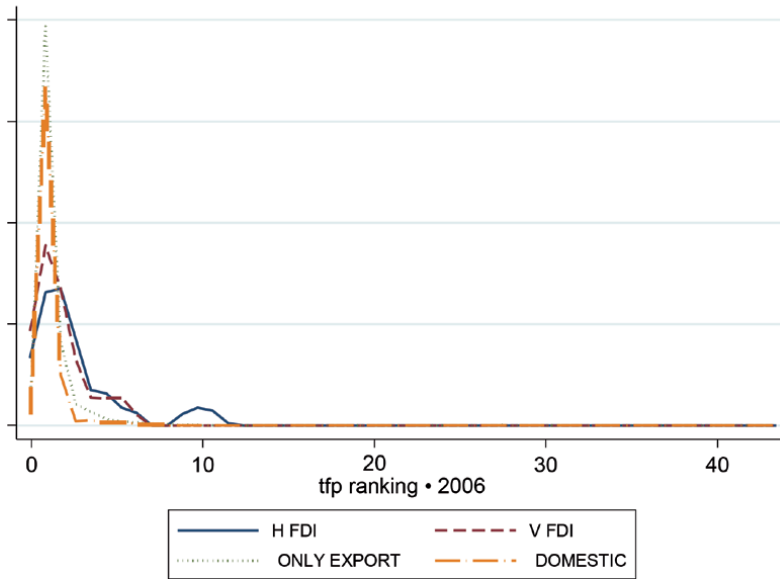
and Publishing, Petroleum Products and Chemicals. On the other side, industries focusing more on horizontal FDI are Office Equipment and Computers, Electric Machinery, Electronic Materials and Transportation. Overall, firms in the whole sample seem to reduce the international activity in 2006 with respect to 2003. However, some industries increase their offshoring activity over time, such as Rubber and Plastics, Non-Metal Minerals, Metals, Metals Products and Furniture, while Food, Beverages, Textiles and Clothing increase their share in Horizontal FDI and, finally, Other Transportation raise their share in Exports.

**Figure 1** shows kernel densities of TFP for the four types of firms in our data set.

The ordering of the firms' productivity seems to be the following: both in 2001-2003 and 2004-2006, firms producing abroad are more productive than those exporting, being the latter more productive than domestic firms.

As the figure illustrates there are productivity differentials among firm groups. The differences are more pronounced for the period 2004-2006. The distribution of the log of total factor productivity (TFP) for the four types of Italian firms are those serving only the domestic market (domestic firms), those engaging in export (pure exporters), those engaging in horizontal FDI, and those engaging in offshoring. concentrated over larger TFP values with respect to exporters. In turn, the latter are better performers in TFP than domestic counterparts. However, the ranking of distributions of firms that perform horizontal FDI with respect to offshorers is not clear-cut as they seem to be almost overlapping.





**Figure 1.**  
 TFP kernel densities across different internationalization modes.

#### 4. Empirical methodology

Since productivity is the key element of our study, in order to overcome simultaneity and endogeneity problems of parametric approximation of TFP, we use the semi-parametric method suggested by Levinshon and Petrin [39] and widely used in the literature.<sup>3</sup> Specifically, this estimator permits to estimate production functions using firm-level data and solves the simultaneity bias of correlation of productivity shocks and input choices by using a composite index of materials (intermediates) to proxy unobserved productivity shocks.<sup>4</sup>

Consider the following Cobb-Douglas production function:

$$y_{it} = a_0 + a_l l_{i,t} + a_k k_{i,t} + w_{i,t} + u_{i,t} \quad (2)$$

for the LP estimation it becomes:

$$y_{i,t} = a_0 + a_l l_{i,t} + a_m m_{i,t} + a_k k_{i,t} + w_{i,t} + u_{i,t} \quad (3)$$

where  $y$ ,  $l$ ,  $k$ ,  $m$  are respectively the log of output, employment, intermediate inputs, and capital stock for firm  $i$  at time  $t$  and  $w_{s,t}$  is the productivity shock observable by firms. Although also this method of computation of TFP suffers some significant identification problem, it allows us to limit endogeneity issues. The regression implemented sector-by-sector on each wave's three-year panels uses materials from the balance sheet data as well as white and blue collars as labour

<sup>3</sup> The Levinshon and Petrin measure of TFP has been calculated by implementing the `levpet` routine available in Stata.

<sup>4</sup> The method relies on a function in which intermediate inputs are used to control for productivity and this has an advantage over the Olley and Pakes [40] method which uses investment to proxy for productivity. In our data set (as well as other firm-level datasets) this variable was not available.

inputs. As previously, also these measures at the firm level were re-scaled by the macro-sector level mean<sup>5</sup> of TFP. Finally, we averaged the values over the three years wave.

With this measure we provide results from premia estimates in the Table below. In more detail, we seek to measure the difference in performance among firms in overseas markets according to different strategies. Thus, as standard in the literature, we run OLS regressions to estimate the relationship between firms' performances and various internationalization strategies. The procedure follows the Bernard and Jensen (1995) paper extended to include our strategies as follows:

$$(IS_{i,t} = [HFDI_{i,t}, OFF_{i,t}, EXP_{i,t}, D_{i,t}])^6$$

The regression implemented is:

$$y_{i,t} = \alpha + \beta IS_{i,t} + \gamma Empolymen_{i,t} + \sum_i \gamma_i INDUSTRY_i + \sum_j \delta_j AREA_j + \varepsilon_{i,t}, \quad (4)$$

where  $i$  is the index of the firm and  $t$  is the time indicator  $IS_{i,t}$  is a dummy variable for the international status of the firm, that takes on value of 1 if the firm internationalizes in year  $t$ , and 0 otherwise.  $y$  represents the measure of firm performance. We consider as firm performance measures not only TFP and labour productivity (Value added/L) but also the capital/labour ratio and gross sales per-worker. As usual we control for industry, region dummies and firm size measured by the number of employees. Productivity premia calculated by the  $\beta$  coefficient are reported in the **Table 3**.

In the second part of the Table we have divided our firms by country destinations of their internationalization activities. The geographical areas of internationalization of Italian firms in our dataset have been distinguished in the North in which we have included all high income countries (EU15), USA, Japan, Canada, Australia) and the South in which we have included less developed countries (East Asian countries and 8 Central and Eastern European countries (see Appendix).

The analysis of the simplest strategy considered (i.e. purely exporters), EXP yields the clearest outcome: exporters perform better than domestic firms in terms of TFP<sup>7</sup> sales, capital/labour ratio and labour productivity. Distinguishing by export destination does not affect what just assessed. The main implication of this result is that the importance of distance should have diminished over time in the sense that advances in technology have contributed to reducing the costs of trade. Therefore, the well-established-finding that bilateral trade diminishes with distance should be rethought. Indeed, in some recent papers this puzzle has been explored and some explanations have been advanced, which are based on the concept of "geographic neutrality" (see [41]).

Firms doing both export and offshoring turn out to have significantly larger sales with respect to only exporters. Moreover, they also show larger labour productivity. In terms of TFP, offshorers seem to be better performers than exporters only when the destination country is located in the North. Finally, companies performing both export and horizontal FDI have significantly larger sales with respect to both only exporters and offshorers. Results in terms of labour productivity are not statistically significant, differently from results on capital/labour ratio, that turns out to be larger for foreign investors in the South. Hereby, our investigation shows that FDI

<sup>5</sup> Because of data constraints, we aggregated ATECO 1991 2-DIGIT manufacturing sectors into nine broader categories that are defined in appendix C.

<sup>6</sup> Tests on H FDI and Offshoring are run over a sample of firms all doing also export (domestic firms are dropped). Tests on EX (only Export) are run over a sample of firms that do not engage neither in FDI nor offshoring.

<sup>7</sup> As TFP measure, we use LP estimates, scaled by the macro-sector level mean.

		TFP (2006)	Sales (2006)	K/L (2006)	VA/L (2006)
HFDI	$\beta$	0.738	1.563 <sup>***</sup>	-0.634	0.419
	s.e	0.795	0.302	0.528	0.289
	n.obs.	2605	2671	2670	2671
OFF	$\beta$	0.411	0.858 <sup>***</sup>	-0.032	0.482 <sup>***</sup>
	s.e	0.259	0.177	0.225	0.140
	n.obs.	2605	2671	2670	2671
EXP	$\beta$	0.142 <sup>***</sup>	0.582 <sup>***</sup>	0.068 <sup>†</sup>	0.134 <sup>***</sup>
	s.e	0.048	0.036	0.042	0.028
	n.obs.	4165	4264	4261	4264
HFDI (North)	$\beta$	1.975	1.628 <sup>***</sup>	-0.029	0.386
	s.e	1.272	0.542	0.554	0.449
	n.obs.	2605	2671	2670	2671
OFF(North)	$\beta$	1.119 <sup>†</sup>	1.295 <sup>***</sup>	0.278	0.364
	s.e	0.664	0.377	0.633	0.256
	n.obs.	2605	2671	2670	2671
EXP (North)	$\beta$	0.123 <sup>***</sup>	0.536 <sup>***</sup>	0.089 <sup>**</sup>	0.114 <sup>***</sup>
	s.e	0.047	0.035	0.040	0.026
	n.obs.	4165	4264	4261	4264
HFDI (South)	$\beta$	-0.030	0.666 <sup>***</sup>	0.388 <sup>***</sup>	-0.019
	s.e	0.175	0.104	0.122	0.091
	n.obs.	2605	2671	2670	2671
OFF (South)	$\beta$	0.917	0.468 <sup>†</sup>	0.047	0.467 <sup>**</sup>
	s.e	0.596	0.257	0.528	0.229
	n.obs.	2605	2671	2670	2671
EXP (South)	$\beta$	0.142 <sup>***</sup>	0.358 <sup>***</sup>	0.068 <sup>†</sup>	0.134 <sup>***</sup>
	s.e	0.048	0.031	0.042	0.028
	n.obs.	4165	4264	4261	4264

<sup>†</sup>At 10% significance. Robust standard errors are calculated.

<sup>\*\*</sup>At 5% significance.

<sup>\*\*\*</sup>At 1% significance.

**Table 3.**  
 Productivity premia based on regression estimates.<sup>1</sup>

and offshoring are riskier strategies. To minimize risk during the process of complex strategies of internationalization it is better to enter countries with similar institutional environments which facilitate coordination need. Thus, internationalization performance is better when FDI and offshoring firms choose markets that have preferences and norms similar to those of the home market. Many studies show that institutional distance is important for internationalization choices and FDI flows. Among the dimensions of institutional distance it should be considered legal rules [42], protectionist policies, credit market regulations as well as legal constraints in the labour market [43]. More recently, such concepts come out in Cezar and Escobar [44], that set up a heterogeneous firm theoretical framework, also empirically validated, about the effect of institutional distance on both the location and the

volume of FDI. In particular, they show that the larger the institutional distance, the larger the adaptation costs multinational have to overcome in order to access foreign markets. In turn, large adaptation costs due to institutional gap reduce both the number of firms able to undertake FDI and the profitability of FDI themselves.

Indeed, the inefficiency in FDI and offshoring in the South evidenced in our work may be due to additional operational costs related to extended supply chains. While some costs are expected, such as those of carrying higher inventories due to longer delivery chain, higher costs of inventory obsolescence, higher insurance costs, higher management operational requirements, there are many additional costs that are unexpected and labelled “hidden costs of offshoring” recently investigated by the international business literature [45]. There can also be higher local legal and administrative burdens, country trade disputes resulting in punitive fines and instances of intellectual property theft. It is also felt that more successful products can be better designed and improved by having the relevant functions (design, research and development, production, and sales) close to each other.

## **5. Conclusions**

Based on simple regression tests and using a panel data set of about 7300 Italian manufacturing firms, we have explored in this work to what extent the ordering of the productivity distributions of firms differently engaged in overseas markets conforms to the predictions of the literature. We categorized our firms into four groups according to whether they perform FDI of horizontal type, offshoring activities motivated by comparative advantages of the host country, purely exporters as well as firms that serve only domestic consumers.

Our results suggest that exporters outperform firms serving only the domestic market and outperforms also firms engaging in H-FDI in terms of productivity. Even when we include offshoring firms the productivity of this type of firms is not higher than exporting firms. Hence, our simple analysis shows that firms that perform FDI, either horizontal or vertical do not show higher productivities. The possible explanation of no difference in productivity between these two forms of foreign investments is that they are strictly interrelated and firms engaged in both activities perform equally in terms of productivity. Another reason is that increasing productivity from FDI and offshoring is not a short run phenomenon but it takes time to be conducive to high productivity (see [46]) On the contrary, exporting firms are exposed to new knowledge, technology and greater competitiveness in the global market and take advantage from this exposure through substantial learning processes that may improve their performances. The learning effect of exporting, as the literature shows, does not require a long time spin. On this ground, there is a large body of empirical evidence - known as “the microeconomics of international firm activity [16, 47, 48] that shows a positive correlation between firm productivity and export propensity just after two or three years. This evidence follows key theoretical contributions that points to the existence of large fixed cost of horizontal FDI and offshoring. To these contributions adds the ones that comes from the recent literature on the hidden costs of offshoring. Many offshored activities are strictly linked with domestic processes, which require complex coordination costs and unanticipated organizational need as well as other hidden costs that can disrupt in-house learning processes [49–53].

More work is necessary to demonstrate how these costs arise and quantify their impact especially when the distance between countries and fragmentation of various stages of production in different countries are taken into account. Indeed, when we differentiate our firms by geographical location of FDI and export destinations

we find support to the HMY ranking only for FDI decisions in the high-income countries of the North but not when activities are located in Southern countries. For firms operating in low-income countries of the South the more productive firms are purely exporting firms. This means that more distant markets either in physical terms or in technological and institutional characteristics entail diversities in terms of costs and risks. Therefore, only firms with higher productivity may serve these countries. Overall, the productivity premia of FDI firms are higher for firms operating in high income countries, exporting firms are the best performers across the majority of geographical destinations.

The results of this work is likely to be helpful in the formulation of market entry strategies. Before proceeding with complex entry mode, managers need to evaluate costs and benefits of their moves as well as country risks relative to the home country. In terms of policy implications, the evidence of this work suggests that exporting brings with it potentially positive effects. When evaluating more complex forms of entry-modes managers should consider that they seem to be favorable only for locations in the North where firms have previous experience, the cultural distance is low and where they can find market similarities such as favorable conditions to increase their performance (knowledge infrastructure and availability of qualified personnel). Then, the indication is that for Italy, export-enhancing public policy should promote exporting to all destinations especially considering small businesses, which are the majority in the industrial structure of the country.

By concluding, some caution must be exercised in generalizing the outcomes of this work. A limitation of this work is the small number of firms that perform FDI and offshoring with respect to the number of firms that perform exporting. While it is possible to isolate pure exporters, this cannot be done for the other entry-modes: companies that perform FDI and offshoring are simultaneously also exporters. This status is common to many internationalized firms, especially if the process of internationalization is a sequential one which starts with exporting and then evolves in more complex forms.

Further work is necessary to understand the differences in productivity, if ever any, between FDI and vertical forms of sourcing abroad in the Italian context. Therefore, we expect our analysis act as a guidance to identify more precise impact of different entry-modes on firm level productivity.

## **A. Appendix**

### **A.1 Description of variables**

The source of our data set are the 9th and 10th waves of Capitalia surveys covering the periods 2001-2003 and 2004-2006. The survey sample contains all Italian manufacturing firms with more than 500 employees and small and medium sized firms are selected through a stratified sample. In addition to the detailed qualitative information, the sample is complemented by annual balance sheets data for all the firms included in the sample.

Below is the description of the variables used in the analysis

K = fixed capital stock at the end of the period as the accounting value of net immobilization as reported in the balance sheet.

VA = the balance sheet value added of firm deflated with the corresponding producer price index.

L = total employment has been split between white and blue collars. The number of white collars is obtained by the difference between total employment and the number of hand workers.

## **A.2 North/south definition**

NORTH: EU15, USA, Canada, Japan, Australia, New Zealand.

SOUTH: EU-8 new members after 2003 enlargement, and Russia; Asia (including China); Africa, Centre-South America.

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# Onshore? Offshore? How about Firm Coherency?

*Marco António Mexia Arraya*

### Abstract

Investments in offshore or onshore can be directly linked to improvements in firm performance, whether the measure is costs, sales revenues, profits, or stock market returns. However, what allows firm improvement is the combination of leadership, human capital, corporate strategy, resources, capabilities, and an offering of products or services that create value and a coherent system. This coherence is the basic principle that allows to generate growth opportunities, respond flexibly and capture the opportunities quickly, and creating value for the customers profitably. A survey can be used to check firm coherency assessment and its fitness for offshore or onshore investments. There is no one-size-fits-all approach to choose where to invest, and the management practices that have the biggest impact on performance will depend on geography, culture and local resources. Thus, an evaluation of firm coherency is essential. Managers can use the survey in this chapter to quickly assess their firm's coherent strengths and weaknesses for offshore and onshore investments.

**Keywords:** coherence, resources, capabilities

### 1. Introduction

The demand for a more economical supply chain, the search for a higher profit margin, the dissemination of knowledge and technology, the focus on the core operations and business are factors that promote business models based on “onshore” or “offshore”.

Begins to be buzzwords to mention that the pace of change in today's business environment is greater than it has ever been and/or the business change is no longer a choice. The change happens since forever and it was never a choice, however, its dynamism and consequently speed is what has changed. Now, it's not just the disruption that's influencing business models, the pace is imposed essentially by the access to technology.

Technology is at the heart of change because it is rooted in all elements of business. It drives business models, value creation, shapes the development and manufacture of products/services, influences communication and the sales process, basically define how the firm interact with its customers. But having the best technology only benefits the firm when it is aligned with strategic intentions. Otherwise, it's a waste of resources.

Regardless of the influence of technology, the prosperity of the firm depends of its coherency. What makes the firm survive and thrive is the combination of leadership, human capital, corporate strategy, resources, capabilities, and an

offering of products or services that create value and a coherent system. This coherence is the basic principle that allows to generate growth opportunities, respond flexibly and capture the opportunities quickly, and creating value for the customers profitably.

In this chapter we will discuss how the decision factors for a firm to choose to be on onshore or offshore is the result of its coherency. Next section develops a conceptual framework about onshore and offshore. After we will consider some factors when choosing On or Out, to immediately introduce the firm coherency survey for onshore or offshore choice. Each section discusses their major implications for coherency as a decision factor. We end with a final note.

## **2. Onshore and offshore: the meaning**

Most businesses, including startups, small and medium companies, and multinational companies, they seek to know how a decision about to be in onshore or offshore can benefit their business. Before we go deeper into discussing the decision factor about how to choose it, let us take a look into what these terms actually mean.

### **2.1 Onshore**

An onshore business is the firm that sets up operations in the jurisdiction where it will operate its business or in its home country.

### **2.2 Offshore**

Offshoring can be defined, in a broad sense, as a firm strategy of moving a business process to a different geographical location where it carry out most of its operations to take benefit of another country's conditions that are more advantageous for its business, under the firm's management. That could include research and innovation, manufacture & production, corporate or back-office services, sales and communication, logistics, etc.

Offshoring is no longer promoted solely by cost-cutting considerations or looser regulations but by involving multiple factors, such as: refocusing the head firm on core business activities, a search for and availability of human talent and technologies, speed to market enhancement, increasing strategic flexibility and location-specific factors.

Offshoring takes advantage of these factors by relocating activities from costly economies to the cheaper ones in order to sell the goods or services at a competitive price with a bigger profit margin. Alongside technological improvements, it has been the offshoring manufacturing and production that has lowered the costs of consumer goods and services such as clothing, electronics, computers and digital services.

### **2.3 Outsource**

At its most basic, outsourcing<sup>1</sup> is the business practice of hiring a third-party to perform services or job functions and/or manufactured goods that usually were

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<sup>1</sup> Although it is not our intention to address the theme of outsourcing, and due to the fact that there is a lot of confusion of concepts, it is important to know the difference between offshoring and outsourcing terms when engaged in debate on business strategies.

performed in-house by the firm's own employees and staff. The basic philosophy of outsourcing is to move activities to a third-party as a cost-cutting measure and in order to focus the firm on its core business. Companies may choose to outsource services or goods onshore—within their own country—, nearshore—to a neighboring country or one in the same time zone—, or offshore—to a more distant country.

This way to promote cost reduction, increased competitiveness or increased profits can generate or create a serious problem for the firm: the loss of capabilities. Once the firm moves its service or production to a third-party, it also outsource all the knowledge and expertise. This means that the firm lose its know-how and its manufacturing capabilities. Such capabilities may have long time to create. Once lost, they are hard to return.

Before we dive into the factors to choose were to be, it's important to look at the key benefits and risks between these three concepts (**Table 1**). Here are a few of the main ones:

### **3. Factors to consider when choosing on or out**

The Austrian biologist Ludwig von Bertalanffy (1901–1972) in his studies noted himself for contradicting the Cartesian<sup>2</sup> view of the universe by advocating an organic approach where the organism is a whole greater than the sum of its parts. His studies allowed us to understand the firm as a whole in which all its interdependencies when they are gathered constitute a larger functional unit, thus developing qualities that are not found in the individuality of its components.

Following Bertalanffy's prism, the firm is a complex adaptative system characterized by the interdependence, rather than independence, of its set of logically structured functions, with the purpose of responding effectively to certain objectives ensuring that each part of the firm is a contributor for value creation.

In practical terms the firm as a complex adaptative system with a dynamic relationship with its market, seeks resources—materials— in the external environment, processes them with the help of internal resources—human and technological—and returns them to the market in the form of products or services. The dynamism of the market and the internal relations in the firm cause a deterioration of the system—entropy—, which are contradicted by the development of forces contrary to entropy—syntropia—, and by the ability of the system to maintain stability through change—allostasis.

Being the firm a complex adaptative system and if it looks for maintain its stability through change, to create, deliver, capture value, to make profits and thrive, thus, the firm needs coherency.

#### **3.1 Firm coherency**

Coherency is defined by Cambridge Dictionary [1] as coherence, and coherence according the same dictionary is defined as “a situation when the parts of something fit together in a natural or reasonable way”.

Coherence is a logical, orderly, and consistent relation of parts to the whole [2]. Thus, firm coherence refers to an integrated logic and basis for an effective and efficient, and well understood operation and execution [2, 3].

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<sup>2</sup> The Cartesian's vision is analytical, consists of decomputing thoughts and problems into their component parts and placing them in a logical order; it is based on fragmentation of thought to facilitate problem solving by dividing them into parts.

Key Benefits	Onshore	Offshore	Outsource
Ownership	✓	✓	
Focus on Core Business	✓		
Non-core functions		✓	✓
Cost-effectiveness		✓	✓
Cost Stability	✓	✓	✓
Flexibility		✓	✓
Scalability	✓	✓	✓
Human Capital	✓	✓	✓
Government and Tax Policies		✓	✓
The need for innovation	✓	✓	✓
Globalization		✓	✓
Risks			
Cultural differences		✓	✓
Intellectual property protection		✓	✓
Loss of control			✓
Hidden costs		✓	✓
Lack of customer focus			✓
Lack of synchronization			✓
Reasons for a Strategy			
Growth strategy		✓	✓
Competitive pressure		✓	✓
Access to qualified personnel	✓	✓	✓
Industry practice	✓	✓	✓
Improved levels of service	✓	✓	✓
Business process redesign	✓	✓	✓
Increased speed to market		✓	✓
Access to new markets	✓	✓	✓

**Table 1.**  
*Key benefits, risks and reasons for a strategy.*

Coherency creates value in four ways [4]: (i) it contributes to greater effectiveness, because, the firm can focus on their distinctive capabilities and continually improve what truly matters, (ii) it produces efficiencies of scale, because, the firm can deploy the same resources and capabilities across a larger array of products, services or business units; (iii) it focuses strategic investment on what matters, because, the firm will just research and develop projects that enhance its position and make a difference to customers; and (iv) it creates alignment between corporate strategic intent and operations decision making, and because of that, the workforce understand what is important, thereby executing better and faster.

The concept of firm coherence refers to an integrated logic and basis for action within a firm [3], a focused logic in what it does better than any competitor [4].

According to Teece [5] coherence can be explained as a complex interaction between three classes of variables: (i) enterprise learning, which the authors suggest

as a 'local' phenomena; (ii) evolutionary paths, which it's shaped on the past in terms of their scope and activities, and where they are now in terms of competences and complementary assets, and the opportunities which lie ahead; and (iii) the selection environment, which is a rough measure of the external and internal competition facing the various products the firm produces.

Almost twenty years late Leiwand and Mainardi [4] propose a different approach that derives from the aligning of: (i) firm human resources and leadership, and how they understand the way the firm creates values for customers; (ii) a capabilities system that allow the firm to deliver its value proposition; and (iii) a product and service fit where all products and services leverage the same capabilities system.

These authors have a different understanding of firm coherence variables, but at the same time complementary (that is, mutually supportive or reinforcing) because they follow the same approach: the process/capability approach which is centered on distinctive capabilities that can produce a competitive advantage and superior performance [6–9]. This advantage depends on how specific resources, regarding four main attributes - value, rareness, inimitability and organization (features that resource-based view call VRIO) - are used within the firm in an orchestration to accomplish tasks and to develop capabilities [10–12]. Resources can be divided into tangible, intangible and personnel-based [10]. Regardless of their nature, resources are not productive on their own, but rather must be assembled, integrated, and managed so as to form organizational capabilities to address external environments and meet changing market demands [13]. In other words, capabilities serve to bind different resources, so that they can be identified and organized effectively and efficiently [14]. For an activity to be a capability, it must reach some threshold level of routine or practice and work in a reliable manner [15]. Firms can achieve a competitive advantage by constantly reconfiguring or recombining different types of resources that can alter existing capabilities or generate new ones [13].

This approach is complemented by addressing the importance of an effective leadership that monitors, the human capital, the market, the strategy and the environment to better identify opportunities and threats and adjusting the firm's use of capabilities [16, 17].

Within a firm, coherency prompts sense-making [18] and permits development of competitive advantage, due a shared understanding across employees will make them more engaged positively with the goals and strategies, they understand what is important and that facilitate "to do the right thing", they are more skilled, the systems and processes grow more effective, enabling the firm to out-execute their competitors [4, 19] and striving for achieve that improvement.

Furthermore, at the strategic level, if the firm works in a coherent way, the investments are more likely to further create coherence toward organizational goals, as these investments are consistent with the firm's capabilities [4].

This coherence can then facilitate consistent synergies since it deploys the same capabilities across a larger array of products and services [4].

Lastly, coherency will encourage processes which are essential, providing consistency around firm efforts to achieve improvement goals and performance [19]. Combined, these different aspects will increase performance.

We may conclude that the concept of firm coherence refers both to an integrated logic and basis for action within a firm [3], and a focused logic in what it does better than any competitor [20], i.e., simultaneously and internal and an external perspective for business, translated into what we may consider to be the four building blocks of firm coherence: (i) human capital and leadership; crucial to promote (ii) capabilities; oriented by an adequate (iii) corporate strategy; that is usually supported on (iv) a sound value proposition. These four building blocks together

contribute to “coherence” within a firm and are crucial to promote its performance. In the end, firms’ performance is the result of how management is capable to provide coherence to the way a firm operates and is able to manage adequately the interactions that establish between these factors (**Figure 1**).

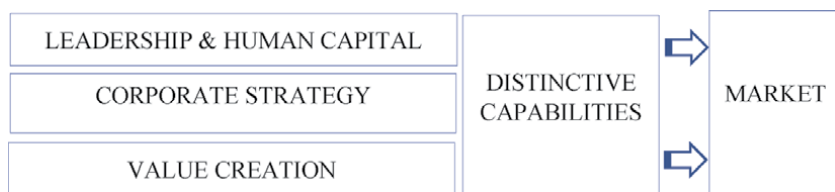
We believe that firm coherence is the consequence of a framework, able to create a transient advantage, whose lighthouse are the strategic targets of the firm and the highest desideratum the customer satisfaction and firm performance. We next provide detail about how we characterize these building blocks on the basis of conceptual discussions.

**Leadership** and **Human Capital** are keys to support the firm to achieve high performance. Value comes through a focus on human capital, teamwork and other strategic related activities [21]. According to the literature of Strategic Management, human capital can be represented by the human resources or “workforce talent” in a firm, which includes the extent to which the employees have the knowledge, skills, competence, attitudes, values, intellectual agility and motivation needed to do the work effectively and simultaneous to support a firm to achieve its goals [22, 23]. Barney [24] suggests that human capital is grounded in individual talents, training, and experience. What makes this qualified workforce a VRIO resource and an important source of competitive advantage especially those who work in dynamic environments where the ability to integrate, build, and reconfigure internal and external competences is crucial to keep advantage and firm performance over competitors [9, 25]. In a situation of resources scarcity, human capital may be the key to a firm’s ability to compete [26].

Good leaders are valuable human capital as they lead the firm toward the achievement of the corporate goals by applying effective leadership [27]. Leadership is a primary mechanism by which groups resolve coordination and motivation problems [28, 29], enhance performance [30], and the leader or leaders is/are individual(s) who have differential influence within a group over the establishment of goals, logistics of coordination, monitoring of effort, and reward or punishment strategies [31]. A leader can range from passive influence to active motivation of followers [32], and he/she integrity (the correspondence between their words and deeds) and decisions influence firm performance by increasing employee commitment and productivity [33, 34].

**Corporate strategy** is crucial to promote the creation of added value, maintain or renewing the competitive advantage for the actual and next cycle behavior, and to create shareholder value [35–37]. Strategy as the determination of the basic long-term goals of an enterprise, and the adoption of courses of action and allocation of resources necessary to achieve the goals [38], being concerned with operations of the entire firm which determines the playing field of competitive strategy at the business level [39, 40].

Corporate strategy in nature has two elements [36]: (i) the industry sector and target customer were the firm should be in, and (ii) the management array of products, services or business units. In other words, corporate strategy is



**Figure 1.**  
*Framework for firm coherence.*



intertwined with value creation and capabilities; it is also what makes the firm whole add up to more than the sum of its parts and the best defense against challengers.

The **Value Creation** is derived from Corporate Strategy and describes how a firm's offer differs from those of its competitors and explains why target customers buy from the firm [41]. Value is created when product or service characteristics and benefits match specific customer needs [26]. A value creation defines the way the firm work by focusing its activities on best solving customer's problem while doing so profitably [42, 43], and when properly constructed and delivered, make a significant contribution to business strategy and firm performance [44]. However, the value creation depends not only on the central role of customer-related factors but also on several interrelated capabilities [20]. In other words, if the firm wants to achieve superior performance must possess the Capabilities (Cap) ability to develop a competitive value proposition, and to convince both the customer and its stakeholders that the firm is committed to the offering.

The critical strategic feature of resources and capabilities is that they represent action potential. Taken together, they represent a firm's capacity to respond to threats and opportunities that may be perceived in the environment, to allow the achievement of firm's goals and the way the firm will exploit as the basis for its strategy [45, 46].

The literature drawing on the resource-based view encompasses various definitions of capabilities. According to Grant [12] capabilities are organizational routines and entail patterns of coordination between people and between people and other resources. Capabilities are developed in the context of organizational resource allocation which is embedded in idiosyncratic structures ([47], p.913), and they represent past experiences and organizational learning [48]. Leiwand and Mainardi [20] mention that **distinctive capabilities** are something the firm does well that customers value and competitors cannot beat, they are the interconnection of people, knowledge, technology, tools, and processes that enable a firm to out execute rivals on some important measure.

Capabilities are the cement that keep resources together and deploys them advantageously [49], they are not observable, are difficult to quantify, and cannot be given a monetary value [14]. They are so deeply embedded in a system that they cannot be traded or imitated [4]. Furthermore, they address complex processes across the firm such as product development, customer relationship, or supply chain management [47]. Thus, they are a source of competitive advantage.

However, for a firm that intends to sustain how much it cans a competitive advantage or to be ready for the next cycle it is vital to deploy VRIO resources through capabilities that match, integrate, create, adjust or modify both in order to be in line with its strategy and value proposition to capture value [11, 45].

Our model departs from the idea of "organizational effectiveness" [5], updated with the approach of "transient advantage" [35] to assess the way "Coherence" affects firms' performance. So, we understand that a coherent firm is structured to take advantage of the social networks and processes' complexity, allowing information to flow as freely as possible, collaboration (working for a common objective) and cooperation (sharing freely) flow both ways, promoting and encouraging coherent actions and affording collaborators the space to make sense of it, and share their experiences and knowledge [50].

A coherent firm build deep, scalable knowledge and expertise in just a few areas and arenas; it aligns and quickly moves its strategy and day-to-day decision making to take advantage of them [20, 35]. It becomes coherent only when its capabilities are deliberately chosen and implemented to support the corporate strategy and value proposition [20].

Coherency creates value in four ways [4]: (i) it contributes to greater effectiveness, because, the firm can focus on their distinctive capabilities and continually improve what truly matters, (ii) it produces efficiencies of scale, because, the firm can deploy the same resources and capabilities across a larger array of products, services or business units; (iii) it focuses strategic investment on what matters, because, the firm will just research and develop projects that enhance its position and make a difference to customers; and (iv) it creates alignment between corporate strategic intent and operations decision making, and because of that, the workforce understand what is important, thereby executing better and faster.

According to our framework the way a firm can achieve corporate coherence is through the relationship among human capital, a real top management team, corporate strategy and capabilities. In fact, a firm's strategy is a journey that needs a continuous knowledge, talent and leadership, where all leaders must accept and own strategy as the heart of their responsibilities [3, 51] and the capabilities are an arsenal that the firm has to play with in the serious game of business [46].

#### **4. Firm coherency survey for onshore or offshore choice**

A survey is frequently the best and reliable way to discover and to get information about what people think, want and compare. Which drives us to learn more about something. In case the reader is undecided about the best alternative for your firm, we suggest that you respond to our survey proposal and meditate on the result, perhaps have its usefulness in the decision-making process.

Rate your firm coherency on each statement, using a 1-to-5 scale —strongly disagree (1); disagree (2); neutral (3); agree (4); strongly agree (5). Offer your best guess for any item that you are uncertain about, and make sure to check the “Not Sure/Don't Know” box that corresponds to it. Then, follow the instructions at the end of the survey to estimate which is your best option —onshore or offshore.

Just as any survey or framework involves continuous refinement based on feedback, the firm coherency survey for onshore or offshore choice factors that drive decision makers may shift. Thus, it's important to regularly adjust the survey and correlate it with firm's goals.

So, what your firm choose? Did the five blocks score in the 100 to 125 range? Did the coherency block score in the 20 to 25 range Did the respondent mark three items “Not Sure/Don't Know”? If the answer is an authentic “yes” to these questions, the firm is well positioned to choose and compete by using its coherent framework advantage. But if the answer to one or more of those questions is “no,” then the firm must think and meditate about the score.

#### **5. Research implications**

The coherency survey proposed (Table 2) interrelates the dimensions of a decision for an Onshore or Offshore business model. It is proposed that a range of coherent organizational factors will facilitate the decision and that the coherency theoretically achieved has consequences for business performance.

A key contribution to the literature is that the coherency survey provides a conceptual basis for understanding coherent dimensions, and also launches the discussion about this important domain. As such the main aims of this conceptual survey should be exploratory: to gain further insight into the research, and to refine and measure the dimensions proposed by the survey.

<b>(i) Leadership</b>	<b>Onshore Score (1 to 5)</b>	<b>Offshore Score (1 to 5)</b>	<b>Not Sure/ Don't Know</b>
Rate the probability, in each of the options, of the senior management team to adapt to the culture of the native workforce.			
Rate the probability, in each of the options, of the mid-range management team to adapt to the native workforce.			
Rate the probability, in each of the options, of meeting locally people with leadership skills and a spirit to act as a team.			
Rate the likelihood, in each of the options, of meeting locally people with leadership skills and the spirit of coaches or mentors.			
Classify the probability, in each of the options, of meeting locally people with leadership skills and development of interpersonal relationship.			
<b>Subtotal</b>			
<b>(ii) Human Capital</b>			
Rate the probability, in each of the options, of finding the right people to execute our strategy.			
Rate the probability, in each of the options, of finding people with great ability to engage with the firm.			
Rate the probability, in each of the options, of access to qualified training programs.			
Classify the probability, in each of the options, of finding people with knowledge and adaptability.			
Classify the probability, in each of the options, of finding people with the same core values we have.			
<b>Subtotal</b>			
<b>(iii) Corporate Strategy</b>			
Classify the probability, in each of the options, of to develop a strategy clear enough about how to create value for customers.			
Classify the probability, in each of the options, of firm's strategy meaningfully differentiated from firm's competitors.			
Classify the probability, in each of the options, of the local people's culture do not support firm's strategy.			
Classify the probability, in each of the options, of the firm's strategy execution creates relatives' advantages over competitors.			
Classify the probability, in each of the options, of the firm's strategy take more markets opportunities.			
<b>Subtotal</b>			

**(iv) Value Creation**

Classify the probability, in each of the options, of finding a partner(s) that in case our business grows, can supplier scale to our needs?			
Classify the probability, in each of the options, of finding a partner that has <b>quality management</b> processes who ensure consistency of quality and meeting deadlines			
Classify the probability, in each of the options, of finding a partner with the same core values we have.			
Classify the probability, in each of the options, of finding a partner that have experience with a business like ours and understand our needs.			
Classify the probability, in each of the options, of finding a partner that adapt to new technologies that make a higher quality product or save money that is passed onto us.			
<b>Subtotal</b>			

**(v) Distinctive capabilities system**

Classify the probability, in each of the options, of finding the best practices in the market.			
Classify the probability, in each of the options, of finding the resources we need for our value creation.			
Classify the probability, in each of the options, of developing the capabilities we need for our value creation.			
Classify the probability, in each of the options, of developing the 3 to 6 distinctive capabilities we need for our value creation. This mean, to do 3 to 6 things very well that customers value and competitors can't beat.			
Classify the probability, in each of the options, the firm distinctive capabilities to work together as a system.			
<b>TOTAL. (Sum of five blocks subtotals above)</b>			

**(vi) Coherency**

Classify the probability, in each of the options, of everyone in the firm articulate our distinctive capabilities.			
Classify the probability, in each of the options, the firm's leadership reinforcing these capabilities.			
Classify the probability, in each of the options, that all leadership decisions add coherence to firm.			
Classify the probability, in each of the options, all firm businesses draw on a superior distinctive capabilities system.			
Classify the probability, in each of the options, that most of the products and services the firm's sell fits with the capabilities system.			
<b>TOTAL</b>			

<i>Scoring</i>		
Take the sum of the five subtotals from the building blocks above, then compare with the coherency block and interpret. The interpretation will be accurate only (i) if the participants have a knowledge of the strategic and operational procedural level of the firm; (ii) if they have an adequate knowledge of the level of performance of the firm, both internally and in relation to firm's competitors; (iii) if the participants have a knowledge about the external environment in both scenarios; and (vi) if the answers are sincerely and honest.		
	The building blocks	Coherency
Total score Onshore		
Total score Offshore		

Count how many times you checked the "Not Sure/Don't Know" box, and consult the chart below.	
Number of times checked "Not Sure/Don't Know"	Your onshore or offshore coherency measurement system is:
0 to 3	Good. The respondent has a clear opinion about the firm and the survey could help the decisions makers.
4 to 5	Adequate. There are likely to be some critical holes in respondent's opinion.
6 or more	Poor. The respondent does not have the basic information he/she needs to support the decision makers.

**Table 2.**  
*Coherency assessment for onshore or offshore investments.*

We suggest that firms that want to start a global activity will be the ideal to test the survey. As coherency is central to this study, a key part will be to secure a sound understanding of what is meant empirically by any dimensions associated with coherency.

## 6. Managerial implications

The value of the survey to practitioners lies in the potential future findings from empirical research based on organizational coherent decisions. To the extent that business performance outcomes could be affected by the decision of choice between Onshore and Offshore, any findings which reveal the dimensions and coherency relations will be relevant to those managers involved in the organizational design and management of a coherent firm.

More specifically the managerial implications relate to the range of organizational dimensions included in the coherency survey. Thus, our survey provides guidance to

those responsible for decide where to be: inshore or offshore. Finally, the survey's proposal that coherency will positively impact the achievement of firm objectives underlines its key relevance for managers as a critical link to performance outcomes.

## **7. Limitations and future research**

This research has limitations common to a conceptual study, a future study therefore may extend the body of knowledge by empirically testing the survey, which may contribute additional insights to this study.

About methodological issues, there is a clear need to test the survey scales. While coherency and further development of existing scales is a good starting point, particular attention needs to be paid to ensuring that the scales are indeed applicable in a decision context. To this end, in-depth interviews with decision makers should help generate an appropriate pool of survey scales with a high level of content validity. Subsequently, rigorous psychometric analysis should be undertaken to assess the dimensionality, reliability, and validity of the derived scales, using survey data from a large sample of decision makers. It is also particularly important to establish convergent and discriminant validity among the dimensions.

## **8. Final note**

Our intention in this work is to present firm coherence approach that privileges the interconnection and coherence between its building blocks. Our approach is dynamic and can be updated on the basis of feedback, experience from actions and new evidences.

It is evident that globalization has left only one true path to profitability: to base firm's competitive advantage on extraordinary coherency. Any returns/paybacks/profits that, historically, have been associated with superior technology and/or access to others kind of resources and capabilities are now too transient to provide competitive advantage. As transients' advantages become less relevant, managing the firm without coherency becomes not only inadequate but reckless, so, a relevant and practical firm coherent approach that searches for value creation it yields better investments and returns.

We hope that our approach will be the genesis of value-creating for customers, employees and shareholders.


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# Offshoring-Outsourcing and Onshoring Tradeoffs: The Impact of Coronavirus on Global Supply Chain

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## Abstract

The world has become a global village with companies investing in different nations to remain afloat and competitive. In the process of offshoring- outsourcing, companies and nations have become interdependent in their efforts to bridge the supply chain network. However, during a pandemic, such as the Coronavirus (COVID-19) that involved the closure of borders, and during which there was a high demand of lifesaving machines and personal protective equipment, many countries were left scrambling for critical medical products such as ventilators and personal protective equipment for doctors. Hence, the tendency away from offshoring and outsourcing to onshoring production. COVID-19 has elicited that countries need to invest in an onshore business if they are to remain afloat. However, investing in onshore (local) business calls for a tradeoff, which some countries cannot afford. Many countries lack skilled labour (developing countries), and where available, it is too expensive (developed countries) making onshore an expensive venture. Besides, promoting manufacturing companies means increased air pollution and greenhouse gases that are responsible for 4.2–7.0 million premature deaths every year, and which costs \$4.6 trillion per year. Such death rates and cost can hinder the onshore business. Therefore, for countries to survive in the era of a pandemic, the best alternative is to build strong ties with offshore-outsourced nations.

**Keywords:** coronavirus, air pollution, manufacturing, public health, president trump, COVID-19, pandemic, outsourcing, Onshoring, supply chain

## 1. Introduction

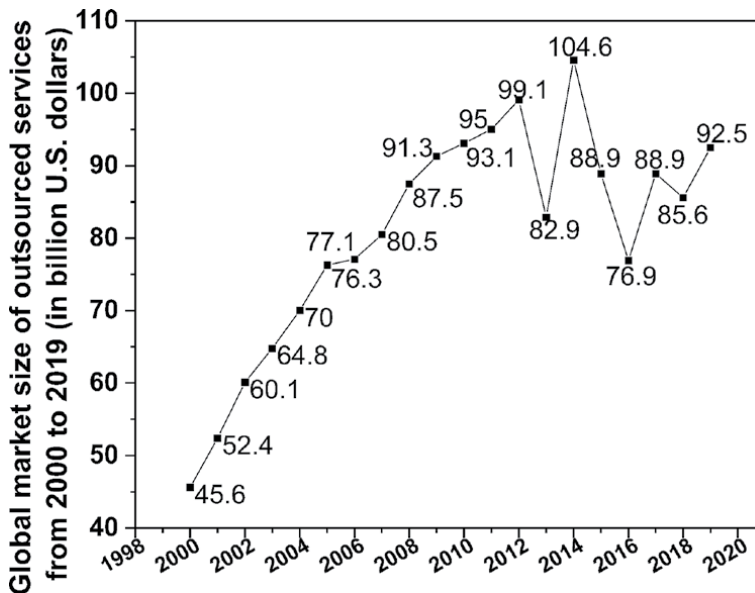
Offshoring is the act of delegating part of business work to an external and/or internal entity that is located somewhere else. Outsourcing involves obtaining certain services/products from a third party, while offshoring companies relocate some of their services/product lines to regions that offer them a competitive advantage. Due to the unifying factor of competitiveness, offshoring and outsourcing can be entangled, leaving a very thin line to separate them—especially in the service sector. Offshoring-outsourcing can involve captive outsourcing, nearshoring, and onshoring, depending on the location of the firm. By 2019, India was the number one

destination for most offshore-outsourcing activities, owing to its financial attractiveness and skilled labour [1].

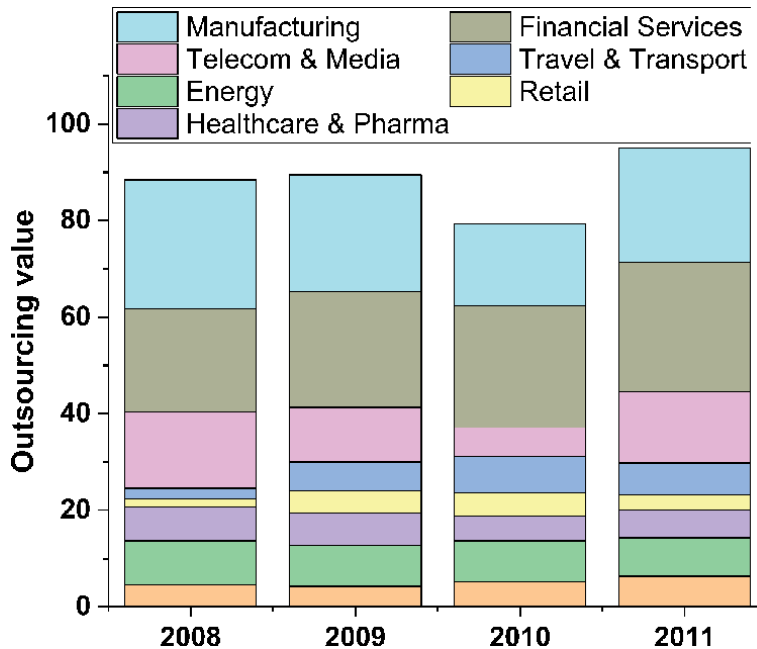
Since 2000, the revenue of the global outsourced services industry had been rising steadily, reaching a peak in 2011, after which it started losing ground, as illustrated by the graph in **Figure 1**. In 2016, the industry market size dropped to USD 76.9 billion, the lowest revenue since 2005. The largest share of the revenue for this industry came from the Americas, followed by Europe and the Middle East, while Africa barely featured. A much smaller share of global revenue came from the Asia-Pacific region [2]. The cardinal role of outsourcing-offshoring is to cut costs such as taxes and production. Some other drivers include enabling a focus on the core business and solving capacity issues. Apart from information technology that accounts for more than 50% of the global outsourcing revenue, other major sectors include business services, energy, healthcare and pharmaceuticals, retail, travel and transport, and telecom and media. **Figure 2** depicts the contribution of some of the selected sectors. However, since the outbreak of COVID-19, many industries have since been affected, causing slack in outsourcing/offshoring.

Ever since the first case of the novel coronavirus (2019-nCoV), was detected in Wuhan, China, towards the end of 2019, and declared a global pandemic on 11th March by the World Health Organisation (WHO) [3], attention has now turned to how countries can survive and revive their economies in the new normal. The magnitude of the resultant shock from COVID-19 has not only tested the healthcare and disaster management systems of countries and the agility of policy responses to a public health catastrophe, but it has also significantly impacted businesses and their offshore-outsourcing processes. Unprecedented interruptions to business-as-usual have quickly cascaded across industries and geographies, especially with the implementation of stay-at-home orders in all sub-Saharan countries.

In this chapter, we present how medical industry and other industries have been impacted during the COVID-19 pandemic in relation to offshoring-outsourcing business. COVID-19 pandemic resulted in border closure forcing nations to rethink of onshoring; in this chapter we present the tradeoffs between outsourcing-offshoring and onshoring.



**Figure 1.** Global market size of outsourced services from 2000 to 2019 [2].



**Figure 2.**  
*Comparison of the total contract value in the global outsourcing market by industry from 2008 to 2011 (in billion USD).*

## 2. Medical sector

Worldwide, the primary goals of the healthcare sector are to cut costs and improve the quality of care. With the acceleration of globalisation, healthcare services are impacted by healthcare outsourcing and offshoring [4]. The healthcare sector's reliance on offshoring-outsourcing is more pronounced in today's operating environment. Many incidences during the ongoing pandemic pointed towards either shortages or the non-availability of various materials at the point of requirement or consumption. The items included, among others, face masks and shields, hand sanitisers, surgical-grade materials, and other daily health supplies, escalating the 'bullwhip' effect on supply chains leading to onshoring [5].

Despite the opportunities for synergies and improved efficiencies of outsourcing/offshoring, the undertakings are more complex and create longer and more fragmented supply chains which could have disastrous consequences, particularly in the healthcare context [6]. In the first quarter of 2020 (the COVID-19 pandemic), the impact on the production and shipment of pharmaceuticals was not felt. However, the delivery of critical items, such as chemicals, soon started dwindling. The impact led regulators and world leaders to assess the extent to which China dominates the world's supply of active pharmaceutical ingredients and their chemical raw materials. An ongoing industry effort in the US and Europe to rebalance the pharmaceutical chemical supply chain is likely to be energised by government initiatives to ensure domestic production of drugs.

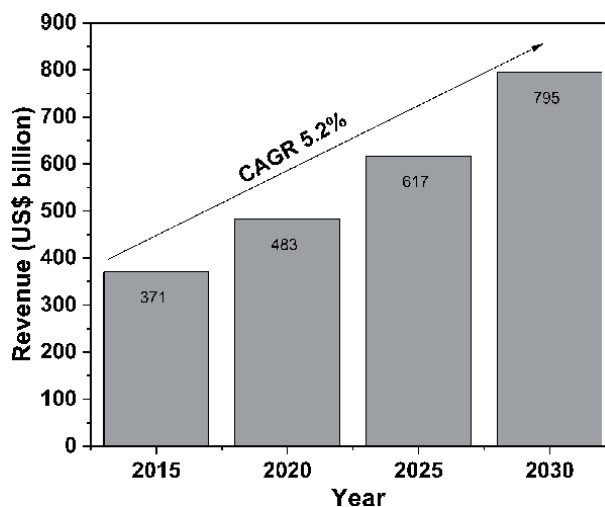
As the coronavirus virus (COVID-19) pandemic has spread, health facilities have become overwhelmed, with potentially infectious patients seeking testing kits and personal protective equipment (PPE) (goggles, gloves, face shield and masks, air-purifying respirators and gowns). These critical items, which have been either outsourced or offshored, are in high demand. Many locations have experienced a scarcity of these products, at a time when they are needed most to care for highly

infectious patients. An increase in PPE supply, in response to this new demand, would require a large increase in PPE manufacturing. An alternative is to outsource homemade masks, which feasibly could include scarves or bandanas. Some countries have even resorted to using unconventional solutions for PPE at local hospitals, such as plastic water bottle cut-outs for eye protection and plastic garbage bags for gowns. Calls for continuity of supplies through the repurposing of industrial capacity and other means seem unlikely to solve the shortage quickly enough, as supply chains have become more dysfunctional during the pandemic [7] and the global crisis can no longer be contained.

With the urgent need for a rapid acceleration in the manufacturing process for a wide range of test-kits (antibody tests, self-administered, and others), outsourcing and offshoring will play a crucial role in this endeavour. By 2019, the global medical device outsourcing market size was valued at USD 104.5 billion, and it was expected to grow at a compound annual growth rate (CAGR) of 5.2% from 2015 to 2030. Due to the increased spending on contract research organisation (CRO) services, the market for medical device outsourcing is expected to increase during the forecast period. As there is an increased demand for medical devices due to the rising prevalence of chronic diseases, various companies are shifting their focus to research and development, and are outsourcing medical devices [8].

Changes to the ISO standards are likely to drive the demand for specialists in regulatory affairs and quality assurance service providers in the developed countries, precisely due to small-medium enterprises requiring third-party assistance to comply with the new ISO standards. Original equipment manufacturers and subcontractors in developed countries, such as Canada, Japan, the US, and European Union countries, are anticipated to adopt new ISO standards, thereby driving the market for medical device outsourcing [9]. In addition, recent regulatory changes in Europe relating to the quality and outsourcing of medical devices are also anticipated to increase the demand for quality assurance services and regulatory affairs, thereby, accelerating the outsourcing offshoring market growth [9]. **Figure 3** shows the projected revenue growth of the outsourced medical service market.

Previously, medical device companies have tended to deliver value, mainly through outsourcing manufacturing and selling their products. However, in the new normal, with mounting pressure on the healthcare system, there are foundational



**Figure 3.** Global medical device sales forecast [8].

shifts in the care delivery model, and as a result, the industry value chain is set for a drastic overhaul. Therefore, companies will need to step out of their conventional manufacturing role [10]. The WHO reiterated this call to governments and industry to increase PPE manufacturing by 40% to meet rising global demand, and to avoid the severe and mounting disruption to the global supply of PPE being caused by rising demand, panic buying, hoarding and misuse. Thus, putting lives at risk from COVID-19 and other infectious diseases. There is no doubt that the lack of PPE puts health workers and patients at high risk of being infected and infecting others with COVID-19 [11].

### **3. Other industries**

Many outsourcing companies that have offshored operations in countries like India, China, Singapore and Vietnam have been devastated by the crisis. Since the global lockdown in March, companies have been failing to deliver orders due to the labour force being forced to stay home. However, although the global crisis damaged businesses, not all companies are losing money. As more people are working from home, the demand for technology that enables online group meetings has skyrocketed. For example, shares in Zoom™ video conferencing companies have risen by 50% since February 2020. Similarly, the demand for TV shows and movies to watch at home soared to the extent that giant streaming services like Netflix™ and YouTube™ reduced the quality of their streaming in Europe to ease the pressure on the internet. Thus, the offshoring-outsourcing of information technology and streaming services is expected to increase post-pandemic to meet the high demand.

The outsourced service industry seems to be less affected, and where it is affected, it is expected to recover shortly, as giant companies will be looking for better ways to cut costs in the post-pandemic era. However, the manufacturing industry has been strongly hit since it involves the movement of parts. In the midst of the pandemic, customers need advanced technology and automation to cope with the uncertainties that companies have been grappling with for the last decade. The outbreak of the coronavirus affected the supply chain and disrupted the supply chain/operation of manufacturing across the world. Companies that heavily offshore-outsource in Vietnam, China and India have been the most vulnerable. The global automotive industry, which imports more than \$14 billion (by 2017) in motor parts from China annually, was significantly impacted [12]. In fact, companies throughout the supply chain are being forced to make tough decisions, like slowing or halting production, resourcing products, and re-evaluating revenue. For example, the Italian-American automobile manufacturer, Fiat Chrysler Automobiles, halted their production in Serbia [13].

The Indian outsourcing market is worth approximately \$50 billion [14]. This includes companies that work in application development areas, such as quality assurance testing services. Companies that rely on outsourcing firms in India range from financial services providers to major technology companies, to name just two of many industries. However, outsourcing firms were simply not prepared for the pandemic and the ensuing lockdown. Outsourcing companies lacked the infrastructure to work remotely while continuing to manage the performance of their teams and meeting client requirements, and their customers are now feeling the pain in the loss of business continuity. Especially in offshore locations, much of the workforce has not previously been set up for this work-from-home scenario, presenting new tactical and operational challenges [15]. The notion of ‘work from home’ is generally not supported by outsourcing companies, and they do not typically provide workers with laptops to use at home. Even if workers have the technology to

work from home, including internet connections and secure systems access, many outsourcing firms require client permission for them to do so.

The outsourcing-offshoring industries do not lend themselves to working from home. For example, because of security concerns, some companies even ask employees to leave even their pens and pencils outside the office. Specifically, the companies that relied on outsourcing firms for their testing services were left in a lurch. Digital quality is now more critical than ever, given our global reliance on digital experiences, and the companies providing those digital experiences are unable to get the testing they need from offshoring-outsourcing firms. In technology, offshoring is simply moving testing from one office to another. Due to cultural and technological factors, that new office may be less capable of ensuring business continuity during a crisis. In addition, offshoring testing services does not equate to an increase in skill sets or the ability to do different types of testing.

#### **4. Pandemic offshore-outsourced tradeoff**

The pandemic has been a wake-up call for outsourcing-offshoring economies; why was the US manufacturing industry unable to supply the necessary materials like face masks, medical ventilators, and PPE? Taken together, the US and other advanced industrial economies have evolved a highly efficient and productive product manufacturing-and-delivery system that provides them with a cornucopia of products at relatively low costs. However, inherent to that system are dependencies and expectations that have been called into question by the pandemic. Such performance has fuelled politicians and policymakers to advocate for a reduction in the outsourcing-offshoring business—cementing President Trump’s call to bring the production industry back from overseas.

The US alone reduced the corporate rate from 35–21% to encourage companies to re-offshore. Besides that, some US policymakers are proposing a \$25 billion fund for companies to re-offshore/re-outsource back to the US from China for the next five years [16]. Companies like Telstra™ in Australia that depend heavily on the Philippines have enacted plans to hire more than 3500 workers back home [17]. At a glance, COVID-19 is likely to deaccelerate outsourcing-offshoring businesses. However, the issue is complex and defies easy solutions, as discussed in the following offshore-outsourced tradeoffs.

##### **4.1 Offshore-outsourced vs. onshore skills**

The challenge lies in a combination of how modern supply networks are structured and the operational metrics that apply to manufacturers. Gone are the days when one giant manufacturer, like CAT™ or Toyota™, could design, manufacture, and assemble the components needed to make a product. Today’s manufacturing technology is too complicated to have all the skills in one place. Thus, manufacturers have resorted to outsourcing-offshoring to search for those missing skills at a lower cost. Even something as simple as a lightbulb has components like LED lights that must be made in high-tech industries. Day-to-day equipment like smartphones, computers, and medical equipment contain components that require a great deal of precision and accuracy, and that need considerable training and experience.

During the pandemic, among the items in most demand were PPE (e.g. masks and gloves) and ventilators; the latter being the most technical that requires detailed skills and experience to manufacture. A ventilator blows air and oxygen into the patient’s lungs, preventing them from collapsing. They are complicated pieces of machinery that cannot be created or grafted quickly. At the start of the



pandemic, the US had 62,000 fully functioning ventilators and nearly 100,000 older model ventilators. With COVID-19 hitting every corner of the country, nearly a million ventilators were required to treat the patients [18]. A single ventilator contains hundreds of parts, and it takes days for an experienced team to make and assemble such parts to produce a ventilator. Ford and GM, leading car manufacturers in the US, spent over 30 days trying to organise the production lines and training workers to produce ventilators [19].

South Africa (SA) was the most affected country in Africa, with almost 750,000 cases of COVID-19 infection by November 2020. For years, South Africa has depended on the United Kingdom (UK) to outsource medical equipment, ventilators included. During the peak of the pandemic in Europe (end of March 2020), Penlon, the leading manufacturer of ventilators in the UK, could not supply SA, citing the incapability of the company to produce extra ventilators for the SA community. In addition, SA could not reproduce the ventilators due to patent rights. The situation reflects the dangers of relying on offshoring or outsourcing vital equipment. However, once SA was able to acquire the patent rights to produce the ventilators, the country did have the necessary skills to produce them. It took weeks for the SA government to find a local 'peep valve' manufacturer, a vital component that allows patients to exhale. The skills needed to produce a single medical ventilator range from fabrication, material processing and simulation to software coding, and such skills are hard to find in a single onshore organisation. Thus, to ameliorate production and meet the much-needed demand, outsourcing/offshoring, some of the parts and skills is the only viable option.

Similarly, the development of a vaccine is one of the critical measures to mitigate the effect of COVID-19. However, very few countries could respond with the required expertise, capacity, and abundant resources. This is mainly because vaccine production methods place certain requirements on the supply chain that include, but are not limited to, novel skills set, meticulous maintenance, production equipment, and ultra-cold chain storage and shipping process. These rigorous requirements have left many countries with the option of outsourcing the service from leading foreign organisations [20]. Storage is a key part of the vaccine process and requires precise conditions of light, glass vials, and a specific  $-80^{\circ}\text{C}$  across the entire supply network to preserve and maintain the effectiveness of the vaccine. The nature of vaccine supply means that there are often several places (warehouses and stores) where items have to be stored before they are finally delivered or administered to beneficiaries. Thus, this is another pandemic tradeoff between outsourcing vs. onshore skills vis-a-vis resources. In particular, the tradeoff is between the onshore skills related to vaccine production to ensure a rapid response and to prevent morbidity and mortality versus costly outsourcing; a demand which is most likely to exceed supply, and which will leave many nations vulnerable and defenceless.

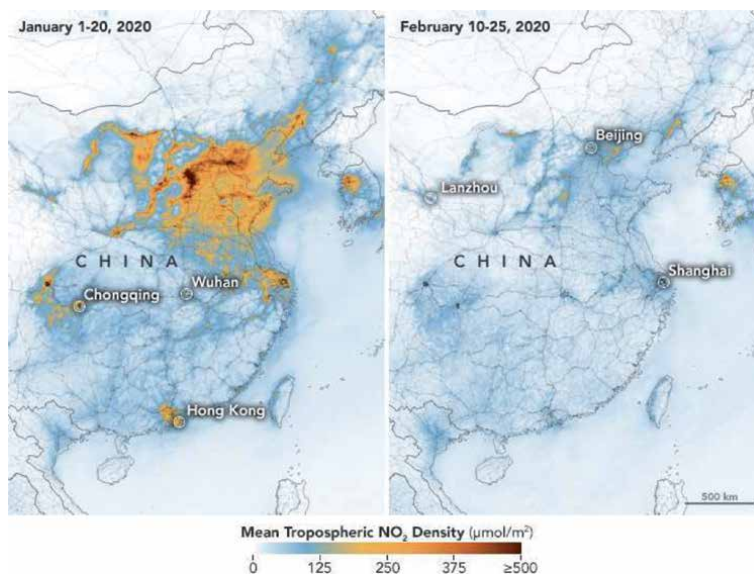
#### **4.2 Offshore-outsource vs. air pollution tradeoff**

Materials that feed the manufacturing industry are localised. The transport of raw materials from Uganda, the Philippines or Vietnam to outsourcing-offshoring economies could mean incurring high transportation costs. Besides, the stringent environmental laws in developed economies could make the processing of such materials practically impossible. Before the UK and US started practising outsourcing-offshoring of some types of business, they had some of the worst air pollutions in the world. The processing operations were sent to the likes of China and India, countries that are now experiencing the worst air pollution ever [21, 22]. Though outsourcing-offshoring countries have paid some price in terms of job losses, the benefit of improved air and water quality somewhat outweighs the price.

Air pollution is responsible for 4.2–7.0 million premature deaths every year [3, 23], and it costs \$4.6 trillion per year [24]. This number barely makes headlines, although it is more than five times the current COVID-19 deaths. COVID-19 has elicited that there is a clear correlation between emissions and outsourcing-offshoring. **Figure 4** shows the mean tropospheric nitrogen dioxide concentration ( $\mu\text{mol}/\text{m}^2$ ) as a satellite image from the National Aeronautics and Space Administration (NASA) in January and February 2020. The levels of  $\text{NO}_2$  plummeted following the virus outbreak in far Asia [25] due to the closure of factories and reduced movement of workers that use cars to go to work. The decrease in ozone precursors, like  $\text{NO}_2$ , could reflect a reduction in ozone levels; however, ozone concentration increased. Ozone breathing triggers COVID-19 like symptoms like chest pain, coughing, and airway inflammation [26]. Another pollutant that is related to manufacturing is particulate matter (PM). PM elevates cancer, premature deaths, coughing and eye diseases, among others [27]. The production of particulate matter below 2.5 microns ( $\text{PM}_{2.5}$ ), a harmful emission, accelerated in countries like China [28] due to outsourcing-offshoring business in the country. As countries are rushing to tradeoff offshoring and outsourcing companies back home, they should meticulously calculate the cost related to air pollution; otherwise, pollution costs might outweigh such a venture.

#### 4.3 Offshore-outsourcer vs. carbon dioxide tradeoff

Among the major greenhouse gases (GHGs), carbon dioxide ( $\text{CO}_2$ ) tops the list. The emission of  $\text{CO}_2$  causes global warming and erratic Climate changes (e.g. flooding). By 2018, China was the leading producer of  $\text{CO}_2$ , 10.06 GT (28% of the total  $\text{CO}_2$  emission), with almost half to the second producer of  $\text{CO}_2$ , the US (5.41 GT, 15% of the world total). The huge amount of  $\text{CO}_2$  production is attributed to the high number of offshore-outsourcer manufacturing companies in the country, as China is the number one destination for offshore-outsourcer companies. The Paris



**Figure 4.**  $\text{NO}_2$  distribution in eastern Asia in January and February 2020, as reported by NASA. The images were captured by Sentinel-5 satellite [25].

Agreement on limiting the global temperature targets a maximum increase of 1.5°C by 2100; however, the current trends in GHG production show that this goal cannot be achieved. In 2015 and 2016, total warming exceeded 1.0°C [29]. Mitigation pathways to limit the warming by 1.5°C by the end of the century are far behind, and they have received little attention. It is estimated that it will cost US\$ 50 trillion to keep the global temperature rise below 3.0°C by the end of the 21st century [30]. If countries are to implement onshoring, and this cost is to be shared based on the emission percentage, it could be too expensive for nations like Brazil and SA to implement onshoring. SA contributes 1% of total CO<sub>2</sub> emission; coal contributes 77% of SA's energy needs. Thus, any manufacturing activity risks the production of CO<sub>2</sub>—a cost SA may not be able to afford.

#### **4.4 Offshore-outsourc vs. livelihoods**

Another pandemic tradeoff is that of offshore-outsourc vs. livelihoods. Most people, especially in many developing nations, live on the poverty line, depending mainly on COVID-19-impacted industries such as travel, tourism, hospitality, call centres, and manufacturing. However, the pandemic presents a catch-22 situation for those nations that provide offshoring and outsourcing business services to multinationals. On the one hand, the countries that provide outsourcing and offshoring services are unable to fulfil their targets due to lockdown, an impact which drives multinationals into bankruptcy and out of their countries. As such, many nations are caught between maintaining their livelihoods by keeping multinational businesses in their countries, which ensures employment, food on the table, jobs, and which prevents multiple deaths from hunger and poverty. On the other hand, against the need to maintain offshore and outsource services, is the risk of increased morbidity and mortality from COVID-19 which places a greater demand on an already strained healthcare system and limited resources such as ventilators and PPE. This has left many nations vulnerable and defenceless to both challenging instances.

Thus, this requires creating an imminent negative or positive restructuring of offshore-outsourc strategies. For example, the several research studies that required clinical trials and the collaborative participation of multinationals in the fight against diseases such as Parkinson's disease, and leishmaniasis (a parasitic disease associated with poverty and malnutrition) have been suspended. The suspension threatens livelihoods that relied on outsourced and offshored clinical services, and the research skills to reduce the impact of such diseases in society [31]. Also, the disruption to the distribution of outsourced malaria-prevention products, such as insecticidal nets, could lead to an increase in malaria deaths in sub-Saharan Africa. Yet, the continuation of offshore-outsourc production and research services equally increase morbidity and COVID-19 mortality.

### **5. Conclusion**

Outsourcing-offshoring has played a cardinal role in the development of our economies and is the backbone of the global market. Our study provides a comprehensive analysis of the current and future trend of outsource-offshore post-COVID-19. The current trend of border closure and transport restriction does not favour outsource-offshore practices, rather onshore business. However, meticulous analysis of the supply chain, shows that the cost of onshore outweighs outsource-offshore as summarised in the following tradeoff benefits.

1. **Skills:** No nation can have all the skills needed to sustain its population, especially in the developing economies. In countries where skills are available, they are expensive to recall offshore businesses. During the pandemic, South Africa had to depend on Penlon skills to get ventilator rights. It took more than six weeks for South Africa to find a “peep valve” manufacturer, a vital component in ventilators. Besides, in the race to find the coronavirus vaccine, most countries must depend on offshore-outsourced business to access the vaccine.
2. **Air pollution:** If countries are to practice onshore, their air pollution is expected to become worse, especially in countries that depend on unrenovable resources. Air pollution is responsible for 4.2–7.0 million premature deaths every year, and it costs \$4.6 trillion per year; this number is three times compared to current COVID-19 deaths. Also, production of nitrous gases and particulate matter particles will increase upon onshoring. Particulate matter elevates cancer, coughing, eye diseases, among others. Such costs make offshoring-outsourcing a better alternative.
3. **Carbon dioxide:** Carbon dioxide is one of the leading causes of global warming and climate change. Today China contributes 28% of total CO<sub>2</sub> emission (10.06 GT), mainly due to onshoring. Such emission has increased flooding in the region and has affected farming in a sector that contributes over 10% of China’s Gross domestic product (GDP). If developing countries that depend on agriculture are to practice onshoring, the cost will be too high—thus practising offshoring-outsourcing offers a better alternative.
4. **Livelihood:** Offshore-outsourced is the bedrock for economic activities that can improve livelihoods and the GDP for countries that offer the business activities for multinationals but keeping the lights on can spiral the COVID-19 cases. However, turning off offshore-outsourced activities to combat the upsurge of Covid-19 leads to job loss, economy plunge, livelihood loss, and rise of other healthcare issues induced by poverty, starvation, and mental health. Thus, countries must find an offshore-outsourced onshore balancing point that is trailed to their own situation.
5. **Demand for medical supplies:** As governments and industries increase manufacturing to meet the rising global demand of especially medical supplies to avoid the severe and mounting disruption to the worldwide supply, offshoring/outsourcing and onshoring models will have to be revised to suit the context while meeting the demand caused by immobility pandemics.

## **Acknowledgements**

We gratefully acknowledge Retha Burger for her suggestions and language editing. We also thank the editor and anonymous reviewers for their thorough review and constructive comments.

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*Edited by Mário Franco*

Outsourcing and offshoring are typically viewed as phenomena allowing competitive advantages for organizations, but some studies have not included the risks, benefits, and challenges of these types of strategies. As such, this book fills this gap by combining several studies from different perspectives. The chapters follow several approaches and applications that researchers explore in different contexts. This book adds to the body of knowledge in outsourcing and offshoring areas and shows how these strategies can stimulate organizations' development in various countries and regions worldwide.

Published in London, UK

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