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Dividing Global Business Process: Safeguarding Confidential Data

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Abstract

This study shows that manufacturing unit process dispersion serves as an operational-level variable that allows businesses to modify their information protection strategy when it comes to sourcing business services overseas to suit the regulatory framework of the chosen host nation as well as the potential for using internal controls over activities carried out overseas. Our hypothesis is that businesses are more inclined to split up their processes among several foreign production facilities rather of concentrating every procedure duties in one unit when the aforementioned mechanisms are unavailable. Businesses may take advantage of the synergies between the scattered pieces of a process while lowering the risk of individual fragment theft because of IT-enabled integration capabilities. Robustness tests and empirical findings closely align with these theories. Additionally, we discover that the likelihood of using the defense mechanism against process fragmentation increases with the firm's expertise in the host nation as well as the alternative worth of the activity's unique knowledge that is outsourced.

Membagi Proses Bisnis Global: Melindungi Data Rahasia

Abstrak

Studi ini menunjukkan bahwa, dalam hal pengadaan layanan bisnis di luar negeri, penyebaran proses di antara unit-unit produksi berfungsi sebagai variabel tingkat operasional yang memungkinkan perusahaan untuk memodifikasi strategi perlindungan informasi mereka agar sesuai dengan kerangka kerja peraturan negara tuan rumah yang dipilih serta potensi untuk menggunakan kontrol internal atas kegiatan yang dilakukan di luar negeri. Hipotesis kami adalah bahwa perusahaan lebih cenderung membagi proses ke banyak unit produksi di luar negeri daripada memusatkan semua tugas proses dalam satu unit ketika mekanisme yang disebutkan di atas tidak tersedia. Perusahaan dapat mengambil keuntungan dari sinergi antara bagian-bagian proses yang tersebar sambil menurunkan risiko pencurian fragmen individu karena kemampuan integrasi yang diaktifkan oleh TI. Uji ketahanan dan temuan empiris sangat sesuai dengan teori-teori ini. Selain itu, kami menemukan bahwa kemungkinan penggunaan mekanisme perlindungan fragmentasi proses meningkat seiring dengan pengalaman perusahaan di negara tuan rumah serta nilai alternatif dari pengetahuan eksklusif yang digunakan dalam aktivitas yang dialihdayakan.

INTRODUCTION

The effectiveness of global services sourcing strategies is contingent upon enterprises' strategic decisions on function, location, and governance style; furthermore, the plan must be implemented correctly after it has been decided upon. This is far from simple, according to scholarly research on the additional and hidden costs of global sourcing as well as anecdotal data that has been covered in the business press. The split of business processes among service production units for operational purposes is one of the crucial implementation-level decisions that businesses must make (Kumar et al., 2009): Which portions of the task should be divided up among several groups and which should be consolidated? According to some writers (e.g., Jensen, Larsen, & Pedersen, 2013), these types of organizational design decisions may assist businesses in reducing the risks associated with worldwide operations in general and global services sourcing in particular (Foss & Pedersen, 2004). One of the potential hazards associated with outsourcing services to other countries is the improper use of confidential information (Contractor, Kumar, Kundu, & Pedersen, 2011).

It is true that the cost and difficulty of exchanging information remotely has significantly decreased due to the rapid advancements in information and communication technologies (ICT). Due to the improved convenience of remote transaction and coordination, businesses are now able to pursue previously unheard-of opportunities for global sourcing strategies. These strategies involve deciding where best to deliver value chain activities, whether they are located domestically or overseas, both within and outside organizational borders. As a result, foreign businesses directly to organizing and integrating interdependent operations that are dispersed throughout nations and may even be owned by other businesses (Buckley, 2009). Multidirectional information and knowledge exchanges across the organizations that make up the worldwide network of multinational enterprises (MNEs) are linked to the value chains' worldwide disintegration. This raises the possibility of information theft and leaking in the absence of adequate protection (e.g., Martinez-Noya & Garcia-Canal, 2011).

When it comes to services that are supplied internationally, proprietary information can include a wide range of potential contents, including customer-related data, operational procedures and critical practices, technical and process knowledge, the firm's strategic direction, and information regarding the viability and profitability of particular options. A substantial amount of research examines how hierarchical types of governance or regulatory organizations for intellectual property protection might lower the risk of theft for businesses. However, the employment of regulatory institutions to safeguard confidential data is regularly debated because many locations that provide competitive benefits for outsourcing commercial services globally have weak institutional frameworks. If, for example, internalizing offshore enterprises

necessitates large capital expenditures in risky and often changing settings or if businesses want to use expertise or resources that a market provider has, then internalizing it could also not be practical or efficient to conduct offshore activities in order to lower the danger of opportunistic behavior. Internal control protection might not be feasible or desired in some situations. Due to the site-specific kind of advantages being sought (e.g., Nieto & Rodríguez, 2011), businesses will need to find an alternative method of protecting their proprietary data unless they are willing to give up the ideal delivery site or the higher qualifications of outside vendors.

Based on this context, we expand upon the theoretical modeling of technological systems modularity by Baldwin & Henkel (2015) and the literature on worldwide R&D for the protection of intellectual property**.** We contend that a different kind of safeguarding for businesses that choose not to give up outsourcing to the greatest place or service provider due to the misappropriation risk involved is to scatter confidential information among several delivery centers that are separate from one another geographically and/or organizationally, so that in the absence of the secret information of the other fragment(s), the usefulness of the confidential information in one unit is limited (see also Contractor et al., 2011's description of prudent outsourcing). This implies that the choice between grouping process jobs into smaller units or breaking up company processes would be based on the risk of theft that companies have when they outsource services to other nations. When a corporation chooses outsourcing over hierarchical governance, it forfeits direct control over its international operations due to the two primary sources of information are the country's legal framework and, more crucially, its style of government of misappropriation risk that are the subject of this article.

Think about a Western company that decides to contract out the creation of an application to India in order to benefit from cheaper labor costs and a huge pool of seasoned service providers. Due to Indonesia's lax information protection laws, using such an approach exposes the company to legal danger as well as the possibility of opportunistic conduct from the supplier it uses. The organization has three options for putting the global sourcing strategy into practice: (1) source every task in the process at the center of the service provider; (2) divide the duties over two or more websites, such one for testing activities and another for coding work; or (3) outsource some work to other countries, but do the majority at home. Compared to while the last two options presented split the process across at least two sites, the first option reduces the vulnerability because the entire procedure is completed in the same foreign service manufacturing unit of the proprietary information. Because distinct the proportion that service production units may access is limited of the overall private information which, in the absence of complementary knowledge held by other production units, has a limited alternative value the incentives for misappropriation are, in

fact, diminished. In addition, the company may function as a system integrator as it keeps the architectural understanding of how each process component functions and has access to them all (Henderson, 1992). IT-enabled coordination capabilities allow it to continue to profit from the complementarities between the internationally distributed service operations.

The overseas service production unit is a center of delivery where a main company sources one or more functional operations in a foreign country, serves as the study's analytical unit. It may be a subsidiary of the main company or the property of an outside service provider that the primary business has an outsourcing contract with. We investigate whether depending on the danger of proprietary information being misappropriated, foreign service production units may be entrusted with all or only portions of business processes (i.e., one or more logically connected task(s) but not all of them) "Set of logically related tasks performed to achieve a defined business outcome" is how we describe a business process (Davenport & Short, 1990: 12). Process fragmentation is the term used to describe the latter option as service activities are more easily broken down into smaller components than entire processes.

Based on a distinct Offshoring Research Network (ORN) data set, the hypotheses are empirically validated. The sample consisted of 581 foreign service production units which were started in 59 host countries between 1995 and 2012, includes businesses with headquarters in 19 native nations. Information on a broad variety of IT-enabled business services offered globally, including R&D, customer support, IT, finance, accounting, HR, and other front- and back-office operations processes are included. Independent legal protection measures from Park (2008) supplement the ORN data collection. Two empirical approaches (matching techniques and non-linear regressions) are used to examine the hypotheses. The empirical model takes supply-side variables into consideration, including the increasing complexity of service outsourcing firms, and we use a number of strategies to mitigate simultaneity and endogeneity risks.

In contrast to sourcing services in nations with stronger legal protections or choosing captive offshoring, it is discovered that businesses that (1) source services in nations with weaker legal protections or (2) employ foreign suppliers for external market services are more likely to divide up the processes that are obtained overseas among many service production units (rather than combining all the process pieces into one production unit). The first relationship is favorably moderated by the experience of businesses in the host nation, and the second relationship is positively moderated by the alternative significance of the data utilized in the processes that are outsourced.

International business (IB) has been forced to reevaluate the conventional understanding of the MNE (e.g., Piscitello, 2011) as a result of the

expanding specialization (Langlois, 2003), interorganizational linkages (Aguilera, 2011), and disaggregation (Zenger & Hesterly, 1997) that lead to an increasing number of MNEs to transition from basic hierarchies to networked organizational structures (Ghoshal & Bartlett, 1990). The current paper contributes to the expanding body of research by demonstrating why, internationalizing knowledge flows across boundaries are not the only measure taken by firms to lower the danger of theft when they source services from outside. ICT advancements have made it possible to fragment company processes in order to conceal confidential information by distributing it. This is now not just a technically feasible alternative, but also a financially appealing one. This enables businesses to continue outsourcing despite the possibility of opportunistic actions from outside suppliers. Additionally, it makes it easier to access assets that are location-bound in nations with scant legal protection.

Thus, the paper offers additional theoretical foundation and empirical backing to writers many have suggested that MNEs have a valid risk-mitigation mechanism thanks to organizational design considerations. In particular, our research indicates that the way business processes are fragmented affects how global services value chains are designed. Businesses adjust the extent to which foreign service production units are entrusted with comprehensive procedures or just parts of them to the risk of information theft that they encounter.

Further evidence that proprietary information protection considerations are important extends from the expansion of several service value chain activities involving confidential data internationally, as well as the integration of a wide variety of IT-enabled business services. However, our results imply that before businesses learn about and begin to appreciate the benefits of fragmenting business processes, they might need to first encounter the shortcomings of a nation's protective institutions.

Crucially, our proposed the effectiveness of fragmentation avoidance strategies depends on the availability of state-of-the-art ICTs, which provide dispersed, interdependent service process fragments to be coordinated and integrated. The benefits of process fragmentation may be outweighed by the costs of global coordination and communication with the lack of ICTs that are widely available and economically priced (Contractor et al., 2010), particularly in the event of services with little added value. This suggests that ICT advancements have two functions. They increase the necessity for protecting private information since, they support the global dismantling of service value chains, on the one hand. Conversely, they allow for a backup safety net in the event that internalization becomes undesirable and the customary legal protection proves ineffective.

In the next section, the conceptual model is created using hypotheses and moderating elements, which also covers

the theoretical underpinnings of the study. The data and empirical model are presented in the section titled "Empirical implementation." Next, we provide our thoughts on the findings and carry out more robustness tests in the "Results" section.The "Concluding discussion" section provides closing thoughts and addresses the article's apparent shortcomings as well as its significance.

THE DEVELOPMENT OF CONCEPTS AND HYPOTHESES

An Operational Framework for Understanding Global Sourcing

Examining global sourcing from an operational or strategic perspective as Kumar et al. (2009) clarify. Businesses choose what activities to source overseas, where to source them, and whether to use a subsidiary or external suppliers for the job (also known as captive offshore) at the strategic level. Expanding upon the ideas put forth by Boeh and Beamish (2012) and Mudambi and Venzin (2010) (also refer to Contractor et al., 2010), we view choices about the kind of government and its location as possibly, but not usually, occurring simultaneously.

The judgments made above must then be put into practice through a sequence of operational-level choices, such as how much control foreign subsidiaries should have in the event of captive offshore (Sartor & Beamish, 2014) or whether or not to fragment processes, which is the subject of our discussion. The real work dispersion process involves determining exactly which tasks to outsource to other countries and which to retain in-house to guarantee that the results of the disparate tasks may be seamlessly integrated to generate the products for the firm or services is the subject of this article, according to Kumar et al. (2009). This is in line with choices regarding "which parts of the work cycle to move offshore, and when and where to move" made at the strategic level of sourcing it (Kumar et al., 2009: 643).

There is a wealth of research on the factors influencing choices at the strategic level about the aim, structure of governance, and setting for global sourcing projects. On the other hand, we are far less familiar with the factors that influence operational-level choices concerning task distribution or colocation when outsourcing business activities overseas. Through an examination of the impact of the danger of private information being misappropriated, the current paper advances our knowledge of these variables.

Risk of Misappropriation in International Service Sourcing

Process fragmentation will only be a desirable alternative when, considering the compromise between increased security and increased organizational complexity, the protection advantage that businesses can get overcomes the price of more complication. The highest potential for misappropriation at that point. Even with sophisticated ICTs making it theoretically possible, the protection gain from coordinating process fragments across numerous

service production units will not be sufficient when the danger of misappropriation is modest. Put another way, the likelihood that moved activities will be fragmented would rely on the risk of theft that businesses have when sourcing services from other nations.

Following the body of existing research, we take into account two factors that increase the likelihood of misappropriation: institutional weaknesses in the regulatory framework of when a company engages with an outside provider, the host country and the absence of direct control over personal data.

The primary goal of regulatory institutions, according to North (1990), is to lower the costs associated with transactions and information. They offer a solid framework that lessens transactional uncertainty and protects property rights. Effective it is required of institutions to ensure that flows of sensitive knowledge and information are protected against risk of misappropriation for activities conducted across international borders. But a lot of institutions in the host nation don't offer this kind of security. In that scenario, enterprises will search because the advantage they want is location-limited, they look for other protective strategies to reduce the risk (Dunning, 1998; Jensen & Petersen, 2013, specifically on international service sourcing).

Thus, internalization theory draws the conclusion that "the exploitation of firms' knowledge-based assets across national boundaries is often most efficiently undertaken internally within the hierarchical structure of the multinational enterprise" building on transaction cost economics (Williamson, 1975, 1991). Therefore, internal control is an essential instrument to prevent opportunistic behavior and protect data and intangibles, especially in cases when institutions are unable to offer this level of protection (Arundel, 2001; Oxley, 1999). Internalizing the activity, however, may be costly (e.g., buy-out) and not the best course of action in order to lower the danger of knowledge and sensitive information flows being protected of action when the skills required are situated outside of the organizational limits of companies for a certain activity. The company must take alternative precautions to protect its private information unless it chooses not to utilize the better external capabilities.

Research on international research and development revealed that companies could then resort to an alternative intellectual protection mechanism, according to which activities carried out in nations with weak intellectual property rights (IPR) are only of their full value when combined with additional extensive activities and value chain knowledge through robust internal connections. One method for achieving this is through process fragmentation. Put differently, breaking up in situations where secrecy and/or legal protection are not suitable options, business services processes across different units (organizationally and/or geographically dispersed) so that the value of one unit's proprietary information is limited

without the proprietary information of the other process fragment(s) offers a third information protection mechanism (see also Baldwin & Henkel, 2015). This is due to the fact that managing the interfaces between interdependent process pieces allows the company to create value in a way that is not possible for individual service production units. Therefore, there are less incentives to steal confidential knowledge than there would as if the units of service output were assigned full control over the process.

Our central claim is that, given geographically limited benefits of location and challenging external capabilities to transfer within the company, in situations where a particular value chain activity is ideally placed in a host nation with weak legal protections or contracted out to a third party; companies are more inclined to entrust foreign service production unit pieces rather than whole processes in order to mitigate the danger of theft. In contrast, companies are more inclined to group jobs and assign complete processes to overseas service production units if there exists legal protection and/or internal controls can ensure confidentiality—for example, in order to take advantage of economies of scale or cheaper expenses of transactions.

H1a: *The possibility that a foreign manufacturing unit may prioritize overseeing a particular process or processes above taking overall control of a full process increases with the level of protection provided by regulatory entities in the host nation for proprietary information.*

H1b: *It is more probable that the overseas production facility will focus on a process area or processes in the absence of internal controls than to be in charge of an entire process.*

We anticipate that the primary relationship will be influenced by the firm's prior experience as well as the substitute value of the activity's private information that was derived overseas, as we will discuss in the next two sections. Because a firm's response to a particular kind of theft risk varies depending on whether it has prior experience in a certain nation or with outsourcing, this expertise has a moderating effect. However, the confidential information's value fluctuates. how much the government or judicial system of a foreign nation preference threatens to protect a company's proprietary information, and consequently, how likely it is to accept paying more for management in return for increased security.

Moderating Effect: Experience With Particular Countries And Outsourcing

A variety of factors of internationalization learning have been identified by scholars as influencing the type and degree of foreign commitment, following the groundbreaking work on market entrance by Johanson & Vahlne (1977). Rather than depending on acquired businesses, organizations with expertise in overseas ventures gain ability to start greenfield operations because they are

more adept at utilizing local resources**.** According to Delios and Henisz (2003), this type of learning also addresses the capacity to reduce institutional uncertainty related to, say, the host nation's legal system. Perkins (2014) provides evidence in the telecommunications sector that the organizational capabilities resulting from the breadth, depth, and familiarity of previous regulatory experience significantly influence overseas performance and survival.

The creation of these organizing skills would lower the cost of the interface function and increase the distributed service's efficiency fragment integration within the framework of globally dispersed service pieces. Process fragmentation would be more likely as organizational complexity became less limiting. As a result, we will manage the regressions to rule out a direct impact of prior global sourcing expertise.

However, we also anticipate that the relationship between the chance of process fragmentation between production units and the danger of information theft will be mitigated by a company's prior experience.

Indeed, the theoretical reasoning behind Hypothesis 1 presupposes that businesses are conscious of and cognizant of the danger of misappropriation they confront. However, a wealth of evidence suggests that companies frequently make snap decisions about sourcing before fully comprehending the actual expenses and dangers related to the specific nation and model that they have selected. That is among the factors contributing to the well-known issue of unreported costs (Larsen et al., 2013). Experience gained from past and present overseas projects will eventually serve as a vital source of organizational and contextual expertise. Firms would therefore gain expertise and comprehend the underlying the risks and expenses of distributing value chain operations, making them more capable of organizing and executing future global sourcing initiatives..

In particular, knowledge of regional organizations and the law shortcomings would assist businesses in determining the misappropriation risk's location-specific precursors and in progressively implementing mitigation techniques to lower that risk. Experience makes it more likely that, when starting a new venture, the company will turn if the local legal protection environment is indeed inadequate, to a different protection method, such dividing up operations amongst industrial divisions.

Comparably, enterprises would be more aware of the source of misappropriation risk unique to a certain model if they have previously been exposed to the potential for opportunism brought on by external governance systems. This knowledge would make companies search for alternate protection mechanisms like process fragmentation while launching new outsourcing projects, even more so than if they had no prior outsourcing experience and, as a result, were unaware of the danger of not having direct control over activities conducted abroad.

This leads to the second moderating hypothesis, which states that firms with weak legal protection or no direct control are even more likely to turn to alternative process fragmentation protection mechanisms they have already experience with, correspondingly with the particular host country (Hypothesis 2a) or with outsourcing (Hypothesis 2b), due to their increased awareness of the misappropriation risk they face.

H2a: *The probability of fragmenting business processes sourced globally is positively correlated with the absence of legal defense and has a higher probability of affect enterprises with more experience in the host country than those with less experience.*

H2b: *The probability of globally sourced business processes becoming fragmented is positively correlated with the lack of internal controls, and this correlation is stronger for companies with more greater than for individuals with less experience with outsourcing.*

Moderating Effect: Alternative Value of The Proprietary Information

According to Nieto and Rodríguez (2011), not all activities can be easily divided and distributed evenly, hence the kind of activity that is supplied overseas may have an impact on the possibility of of process fragmentation. This is especially true when face-to-face communication in real time is required, as demonstrated by Kumar et al. (2009). Because it is now simple and inexpensive to move codified knowledge across borders thanks to advancements in ICTs, processes involving codified knowledge are therefore more likely to be fragmented (Narula & Zanfei, 2005). As a result, we shall manage the regressions for the type of work that is outsourced to foreign countries. However, we also anticipate a side effect.

Up until now, the relationship between the risk of proprietary information being misappropriated and the degree of weakness in the host nation's legislative safeguards for outsourcing and the absence of direct oversight over foreign operations have been treated as invariant in our argumentation. But the literature on risk management has long highlighted that a company's exposure to risk is determined by the likelihood of an unfavorable event in our case, misappropriation of information occurring as well as the potential damage to the company should the event materialize.

When discussing global sourcing, the term "proprietary information" encompasses both the trade secrets that provide companies with a competitive advantage—like the recipe for Coca-Cola syrup, for instance and the confidential information that businesses are legally required or choose not to reveal. Examples of this type of information include client-specific private information that businesses are not allowed to share without the express consent of the parties involved or broken-down sales and profitability data that businesses may decide not to disclose. However, not all kinds of data have the same level of risk of being misused, and when they are, the harm

caused will vary. The potential worth of the private data utilized in the operations determines the misappropriation risk a firm confronts, even when two tasks are outsourced to the same nation with limited legal protections and the same outsourcing governance model (Buckley & Casson, 1976; Williamson, 1975). Therefore, it has been discovered that activities related to a company's core business, creative and innovative roles, and knowledge-intensive processes are especially vulnerable to the risk of misappropriation.

It could be argued because valuable jobs are not as likely to start with to be outsourced. However, there is strong evidence that businesses have begun to outsource more and more high-value tasks to other countries, including product development and research and development. However, companies may use a different operationalization of the offshore approach to high-value operations than to low-value activities, even if they are not less inclined to offshore. As previously mentioned, firms are when there is insufficient internal supervision or inadequate legal protection, people are more prone must look for a protective device that works well. Because the danger of theft is more often when private information has a greater alternative value than a lesser one they are also more inclined to fragment processes and tolerate higher coordination costs in return for better security.

Thus, we anticipate that the relationship proposed will be impacted by the type of work that is outsourced to other countries in Hypothesis 1, more so by the alternative worth of the private knowledge utilized in the activity than by the degree of codification. Specifically, we postulate (Hypothesis 3) that high alternative value proprietary information will have a greater favorable impact on the probability of process fragmentation due to the shortcomings the regulatory framework of the host nation and the absence of internal control when outsourcing than low alternative value proprietary information:

H3a: *The probability of fragmenting business processes sourced globally is positively correlated with the absence of legal protection, and this correlation is stronger for activities where the proprietary information involved has a high alternative value than for those where it is low.*

H3b: *The possibility of globally sourced business processes becoming fragmented is positively correlated with the lack of internal regulations, and this correlation is stronger for activities involving highly valuable proprietary information than for activities involving less valuable confidential data.*

CONCEPTUAL MODEL

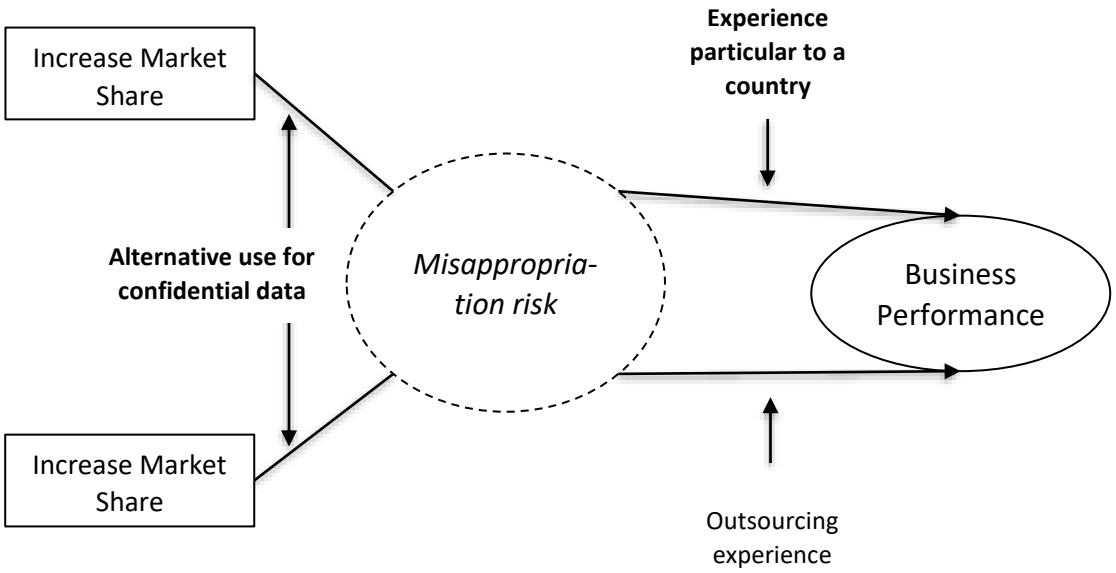

Fig. 1 Conceptual Model

EMPIRICAL IMPLEMENTATION

Data Sources and Sample

Our empirical study's data set is derived from Indonesia, longitudinal surveys that were carried out between 2018 and 2023. The Indonesia dataset is an reduction of the data collection procedure used by academic academics in multiple Asian nations. There are representations from businesses in the manufacturing and service sectors, and the procurement initiative's host nation is unrestricted. Production activities are not included in the reporting; only foreign acquisition of business operations and technical services included.

Every service or business unit is subject to a survey that gathers data on a variety of topics, including the activities involved (such as process fragmentation), the internal (own subsidiary) or external governance model selected, information about risks and performance outcomes, and the tactical factors that guided the placement of the specific service. The scope of work carried out in each production unit, the kind of government, the home and host countries, the date the activity was first started in that specific foreign country, and factors that are connected to aspects that influence site choice and the reasons why businesses engage in global sourcing are all used in this article. We supplement the survey-based data with information from outside sources about the institutional content protection landscape (nationally).

By controlling for other factors that affect the values and advantages of value chain segmentation**,** it is possible to evaluate the effect using the unit of observation to be the overseas service production entity (distribution center where a focal firm sources a certain sort of service activity), an analysis is conducted on the impact of different protective measures on the dispersion

of processes with foreign sources**.** Our sample comprises 340 service units of output. We examine the value chain from a functional perspective, considering both internal and external manufacturing units, which do not exclude segments based on the producer's type (i.e., the company or an outside supplier).

Researching the use of complementarities in business process fragmentation as a defensive strategy is especially well-suited for an example of services provided internationally. First, a crucial feature that sets service production activities apart from the majority of manufacturing production activities is their requirement for contact (Gallouj & Weinstein, 1997). This requirement also shows that there are similarities and differences across the different tasks (Arora & Ceccagnoli, 2006). Second, in the framework of service outsourcing, both domestically and internationally, there is evidence of significant relationships between service delivery locations that are internal and external.

RESULTS

Main Models

Hypothesis 2a states that the impact of the preceding model's inadequate legal protection is strengthened by businesses' prior experience operating in the host nation. The weak legal protection variable has a substantial coefficient. This suggests that enterprises with experience in a certain host country are far more likely to face the negative effects of insufficient legal protection on international business processes than are firms without such experience. Firms are more likely to secure by restricting the range of tasks assigned to various service production divisions, their confidential data when they have more familiarity with the country-specific legal protection framework.

The lack of evidence supporting Hypothesis 2b implies that we are unable to distinguish between firms based on their inclination to replace the fragmentation that makes it impossible to secure private content's secrecy mechanisms, regardless of whether they have previously gained outsourcing experience or not. Stated differently, the empirical data does not support the notion that a firm's prior experience with overseas outsourcing influences its information protection practices.

The fact that businesses may eventually choose to work with the same service might also account for the lack of any discernible impact providers they have established trustworthy connections with to counteract the absence of direct authority. Alternatively, it could suggest that education and past experience are two different but related ideas, and that one does not always imply the other (e.g., Anand, Mulotte, & Ren, 2015).

Regarding the result of the exclusivity knowledge's alternate value, we discover that it has no discernible effect on the chance of international processes becoming fragmented due to inadequate legal protection. Since there is no significant difference between the two subsamples, the effect is still

substantial, negating the verification of Hypothesis 3a. However, the impact the likelihood of an internal control variable being absent is significantly higher when it comes to high-information value tasks, as conjectured in Hypothesis 3b.

Additional Analysis and Robustness Cheks

We have evaluated multiple iterations of the previous empirical models to confirm that the results are stable. To make sure endogeneity concerns don't influence our findings, we've additionally run further experiments.

First, by include host-country fixed effects, we may further validate Hypothesis 1 because each country's measure of legal risk fluctuates over time. This makes it possible to isolate host-country effects that are unrelated to legal risk, which could skew estimates by influencing the likelihood of international process fragmentation.

Second, we investigated with two different measures of intellectual protection to make sure that the particular legal protection measure has no bearing on the validity of Hypothesis 1 that has been in use thus far. One well-known indicator of the degree of IP protection that patents offer is the Ginarte and Park index was initially used to replace the original measure. However, some have criticized the index, claiming that it ignores how well the safeguarding structure is enforced (Branstetter, Fisman, & Foley, 2006). Using the reasoning that laws without consequences are worthless, and laws without consequences is also meaningless, we employed the result of multiplying the World Bank "rule-of-law" governance index by the Ginarte and Park index (Kaufmann et al., 2010) as a second alternative measure (variable denoted.

Third, we took into account the potential for interactions between the two model's primary variables. An outsourcing model combined with low values in the variable of legal protection may have a greater impact than the total of these factors' separate effects. Sadly, it is not possible to interpret cross derivatives produced using non-linear regression interaction estimations (see Greene, 2010; Norton, Wang, & Ai, 2004). However, when the proper conditions were met, none of the interaction parameters that we assessed had a substantial impact approach to calculate the cross-derivatives relevant to each observation was applied. The lack of a discernible interaction may indicate that there is only a partial replacement among the three protective mechanisms (Cohen et al., 2000). However, Greene (2010) claims that the Norton et al., 2004 appropriate estimation technique is "generally uninformative and sometimes contradictory and misleading." This clarifies further why, rather than calculating interaction coefficients during the analysis stage, we addressed interaction effects through model design for the moderating components, as suggested by Greene (2010).

Fourth, we repeated to confirm the experience impacts' stability, the estimates were performed using varied

sample splits depending on varying expertise levels. Rather than utilizing we divided the sample based on the median value of the national experience and outsourcing experience variables so that the remaining 63% greatest values were on the other hand and the 37% every experience variable's lowest values were found on the opposite side. Then, we changed the thresholds so that one subsample had the lowest 63% and the other subsample had the greatest 37%. Apart from the results remain unchanged despite a loss of significance in the test utilizing the 37% threshold sample split for the difference in the estimated coefficients for the legal protection variable. Additionally, we thought about adding "Software Development" to the group with "high information value" as opposed to "low information value." group. The sample split was modified, which supports earlier findings regarding the information value moderating effect. In particular, the variation in internal control variable estimations is significantly higher the disparity in the estimates of the variable for legal protection is unchanged in both subsamples significantly. We evaluate according to Mudambi (2008), who identified high value-added activities as the value chain's extremities. By moving marketing efforts to the high alternative value information subsample, the second alternative sample was linked to the alternative value of information. It validates the findings about the moderating impact of the alternative value of private information once more.

Fifth, we wanted to rule out the possibility that the home nation's legal protections might affect the arbitrage between the three protection systems, as this could create a bias from a missing variable. As soon as the "Main Model" incorporates the home country's legal protection risk. The focus variable estimates for "No Internal Control" and "Content Legal Risk" have the same impact and significant levels. Furthermore, we discover no discernible correlation between the likelihood of businesses using the process fragmentation and the potential for domestic misappropriation protection mechanism overseas.

Sixth, we confirmed that, rather than representing the dispersion of global business procedures in response to risk information and knowledge misappropriation, a drop in local commitment, or scale modifications, of manufacturing units for overseas services is not taken into account in our results. We added an extra control variable for the size of the foreign service production unit, which is determined by taking the log of the number of employees to examine the hypotheses despite the fact that data was only available for 340 units sample. The findings concerning each of the three theories didn't change.

Seventh, we made sure that there are no erroneous effects when we combine the focus variables with the different internationalization incentive controls and location choice drivers. As shown, the primary results remain unchanged when these controls are removed.

Finally, the primary the model currently restricts the computations to worldwide

sourcing operations primarily motivated by the exploitation of locational advantages. This eliminates the possibility of endogeneity bias, which could have an impact on the results if the operational decision of process fragmentation had an impact on the host nation's strategic decision. This guarantees that activity scoping motivations do not lead to the national risk that a firm faces, much as Gooris & Peeters (2014). The results on terms of level, sign, and significance, the main hypotheses and moderating effects hold true for both the limited and unrestricted samples despite the restriction reducing the sample by 8%.

CONCLUDING DISCUSSION

The expenses of transactions and coordination involved in overseeing global value chains are decreased by quick advances in ICTs. Although this makes it easier to enter new markets and reorganize the way services are produced, the consequent distribution of confidential knowledge and information makes businesses more vulnerable to service process theft.

IB research has long emphasised how enterprises can reduce that risk by internalising their overseas activities and making a strategic choice about the host nation. Although Oxley (1999) contends that the only way to address a host nation's absence of legal safeguards for intellectual property is through hierarchies, since internalizing an activity might not be the best course of action if the firm does not have the best capabilities for it. Similarly, as comparative advantages are place-bounded, it might not be the greatest idea to avoid a specific location if it offers the finest expertise, capabilities, or the activity's lowest cost due to insufficient legal protection (Cantwell & Mudambi, 2005). Avoiding the nation could mean giving up a potential source of competitive advantage for the company. The coordination of global value chain networks then revolves around how to adjust information security protocols to align with the governance model of global sourcing initiatives and the host country (see also Piscitello, 2011).

In that context, we address how, in situations when internalization is not the most efficient form of governance, or when the country that is best suited to source an activity from offers only restricted legal protection, the separation of global business activities over many service production units may provide a solution to the information protection challenge faced by businesses. The of procedures among production units, according to foreign service production units serve as an operational variable that allows companies to modify their data security measures strategy in accordance with the protection mechanisms offered by the chosen governance mode and offshore nation. The incentives for misappropriation are lessened when limited private information linked to a specific segment rather than the complete process has little to no outside value as stand-alone knowledge.

We discover that the value of the confidential data that was acquired from abroad and used in the activity had

no bearing on how well an individual adjusted to the absence of legal safeguards. However, it is more pronounced when a company has already encountered the shortcomings of the institutional environment in a certain host nation. On the other hand, a company's ability to adapt to the absence of internal controls over its overseas activities is independent of its prior outsourcing experience. However, it appears to be larger when the implicated proprietary knowledge has a higher alternative value than a smaller one.

The study's limitations, as is common with empirical research, provide opportunities for additional investigation. To have a more thorough understanding of the factors influencing a firm's global distribution of operations, for example, shifting the analysis's focus was shifted from specific overseas manufacturing units that contributed to the whole value chain, encompassing domestic service production units for the company would be beneficial. In a similar vein, we emphasize how process fragmentation helps with information protection. An intriguing extension of the current study would be to examine the degree where information security benefits may interact with or be countered by agglomeration benefits, which have been proven to be important in the situations of industrial operations and the (bio)pharma business. Furthermore, rather than viewing process fragmentation as a continuum of fragmentation levels, data restrictions compelled us to investigate it using a binary variable. A continuous variable might be used to find thresholds and non-linear effects, as well as to improve our comprehension of the factors that lead to process fragmentation. Furthermore, we understand that classifying global services sourcing initiatives based on their functional domains is merely a crude and imprecise method of estimating the alternative worth of the confidential data engaged in a certain activity. Lastly, the question of whether process fragmentation could have an additional protective effect for example, for really sensitive information when combined with other mechanisms is left open by this work.

Despite its shortcomings, the article's primary contribution is found in the IB discipline's broad ownership location internalization (OLI) paradigm (Cantwell, 2015). In particular,we explain how decisions about organizational architecture, including the division of business processes, can assist companies in weighing the benefits and drawbacks of particular sites and forms of government (for a request for additional research in this field, see Foss & Pedersen, 2004). We demonstrate that because of the potential danger of theft, the scope of operations assigned where internalization is not desired and legal protection is insufficient, to overseas production units offers an operational adjustment variable that enables enterprises to stay in the most appropriate host country or governance model. Similar impacts have previously been reported within the framework of production and product development initiatives, despite not having been fully validated empirically. Expanding upon

the recent theoretical advances of Baldwin and Henkel (2015) regarding have refined, modified, and validated the case for the function of modularity—a system's separation into distinct modules—as a knowledge protection strategy in the particular setting of business services, where it has been determined that IP protection issues also apply (e.g., Miles et al., 2000), and where ICTs are essential in lowering the cost of remote coordination, which would otherwise deter companies from employing the process fragmentation protection mechanism. Put differently, the present article demonstrates that the trend towards a more detailed analysis of companies' service value chains, which has been discussed by multiple authors, may have information protection as one of its fundamental causes.

Furthermore, our results demonstrate that institutional learning affects organizational factors other than site destination in the organization of value chains. Institutional learning influences how activities are distributed among production units as well because locally knowledgeable businesses are better able to recognize the mechanisms that prevent information-intensive services from being fragmented. Lastly, we offer more evidence for the evolution of MNEs' roles from internalizing knowledge flows to acting as per Brunoni et al. (2001), "system integrators" intentionally manage the exchange of information and expertise amongst their network of external and internal suppliers (also refer to Contractor et al., 2010).

Significantly, this paper makes the argument that advances in ICTs contribute to the expanding geographic dispersion of service value chains, given the crucial role that ICTs play in enabling the safeguard against process fragmentation. Advances in ICTs increase the danger of theft of confidential data incorporated into value chain operations by enabling value chains' dispersion and disintegration across national boundaries.

Additionally, ICTs greatly facilitate the copying and dissemination of confidential data (Miles et al., 2000), which may make property theft more severe. It would be extremely difficult and costly to coordinate and oversee scattered operations spread among perhaps "molecular" service production units if information and communication technologies (ICTs) weren't present. This was especially true for less critical services. To put it another way, advancements in ICTs help to mitigate the risk of misappropriation that they themselves contribute to. If there is a substantial danger of misappropriation, the only option may be to avoid outsourcing and/or offshoring if you don't have access to advanced ICTs. A third path becomes possible with advanced ICTs: process fragmentation among service production units.

Moving on to management practice, we clarify an important but seldom discussed component of value chain structure. Significant guidance has previously been provided about the location, governance structures, and size of foreign organizations.

We identify a safeguard mechanism using the process fragmentation technique that allows managers to take advantage of the increasing opportunities to source services globally while lowering the danger of information misappropriation. Distributing across different service production units the underlying private knowledge of interdependent operations is necessary to achieve this. In the global context of growing value chain "servitization" (refer to UNCTAD, 2004), by doing this, we contribute to the education of executives on the behavior and risk management of service operations under outsourcing contracts and situations with lax legal protections. The conversation also emphasizes the necessity of purchasing cutting-edge ICTs and ensuring that those engaged in widely distributed service activities may readily access and utilize them. If not, the benefits of protection can be outweighed by the additional coordination costs associated with global process fragmentation.

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