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# Firm enablement through outsourcing: A longitudinal analysis of how outsourcing enables process improvement under financial and competence constraints

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ABSTRACT

The dominant view is that outsourcing is driven by efficiency considerations. We demonstrate that a different path to outsourcing originates from critical internal resource shortages. These shortages pose a critical dilemma; on the one hand outsourcing is a reasonably durable approach to solving resource shortages. On the other hand, the same resource shortages complicate the management of outsourcing and may create knowledge and evaluation problems. We empirically examine this dilemma and thereby add to the limited work on the enabling effects of outsourcing under resource constraints. We employ two rich and unique panel datasets of Australian firms observed over five-year periods, to test dynamic change models if firm-level financial and competence constraints induce outsourcing, and if this in turn enables internal process improvement. The results show that outsourcing indeed is associated with both financial and competence constraints, although the impact of these constraints differs over time. In turn, we find that increased outsourcing relates positively to contemporaneous and future process improvement. These findings thus shed a positive light on how outsourcing can enable firms to overcome constraints and realize internal process improvement.

## 1. Introduction

The dominant view on outsourcing, the contracting out of work and activities, as espoused by for example transaction cost analysis, is that firms make outsourcing choices driven by efficiency through the lowest possible combination of production and transaction costs (cf. Geyskens, Steenkamp, & Kumar, 2006). This view requires that firms can make such decisions without constraints. Yet constrained decision-making reflects business reality. For example, critical resource shortages, such as in IT skill availability in the organization, may drive firms to outsource even if from a transaction cost perspective this decision is not efficient. Under such constraints, efficiency-driven theories predict reduced performance (Combs & Ketchen Jr, 1999). Constraints also complicate the management of outsourcing since, for example, limitations in IT skills may create knowledge and evaluation problems (Parmigiani & Mitchell, 2009) that can negate the benefits of outsourcing.

Despite this ominous view on outsourcing under constraints, outsourcing can have important enablement properties, allowing a firm access to a business partner's resource base and benefit from its competencies and skills. For example, IBM touts that its outsourcing services enable agility, lower cost and simplified management.[1] These enablement benefits are tightly linked to the resource-based view of the firm, which considers boundary decisions and performance differences between firms as relating to resources and capabilities in the form of skills, competences and know-how (Barney, 1999; Wernerfelt, 1984). Combined, these potentially positive and negative effects create a dilemma which makes it difficult to predict the enabling impact of outsourcing under constraints: if firms outsource because of constraints, does this help them to better counter constraints (and potentially enable improved processes), or does it adversely influence processes as the outsourcing decision was made under unfavorable conditions? We consider this dilemma of whether outsourcing enables process improvement from a customer's perspective.

In this paper, we seek to address this research gap and examine the impact of resource constraints on firms' outsourcing choices and subsequent enablement effects on internal process improvement, defined as

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[1] https://www.ibm.com/us-en/marketplace/network-outsourcing.

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new or significantly improved operational processes. We do so using two panel datasets of Australian firms collected by the Australian Bureau of Statistics from 2005/2006 to 2009/2010 and from 2009/2010 to 2013/2014.[2] These datasets allow us to examine the impact of both financial constraints (i.e., whether costs of inputs or access to financial resources significantly hampered business activities or performance), and competence constraints (i.e., a perceived lack of skills and knowledge resources within the firm) on outsourcing and subsequent process improvement. In doing so we make the following three contributions:

First, this study provides evidence for an enablement role of outsourcing to customers that, potentially, enable improvements in internal processes. By doing so this study also extends existing empirical work on outcomes associated with outsourcing (e.g., Handley, 2012; Handley & Benton Jr, 2012; Reitzig & Wagner, 2010). In particular, we consider improvement in internal firm processes, which provides a more proximal performance measure than for example financial performance (which is influenced by many factors). Process improvement is also of central interest to outsourcing research (Tsay, Gray, Noh, & Mahoney, 2018). Our focus on process improvement contributes to insights about the value of outsourcing and adds to views that outsourcing may enhance firm value (e.g., Lee & Kim, 2010) by showing a specific role of outsourcing in enabling internal improvements.

Second, this research adds to the evidence that disentangles the roles of factors influencing outsourcing as an enabling mechanism. While prior research has examined a wide range of antecedents relating to the decision to outsource, Tsay et al. (2018) document that over the various levels at which drivers of outsourcing may be found (including the activity/product/process, firm, transaction, environment and decision maker), few are examined at the firm level. Of those studies that consider firm level influences, none that we are aware of focus on how firms' internal resource constraints impact outsourcing. Yet, our findings show that such constraints are associated with firm decisions to outsource which in turn are associated with process improvement. These findings thus speak to the significance of outsourcing as enabling mechanisms particularly when firms face constraints.

Third, our paper contributes to the outsourcing literature by examining a dynamic (instead of the typical static) model where changes in firm conditions lead to changes in outsourcing and consequently to changes in firm outcomes. In practice, outsourcing decisions are dynamic as firms try to adjust by making changes to outsourcing, yet theoretical arguments and empirical operationalization has rarely followed the dynamics observed in practice. This divergence has raised significant criticism that outsourcing is mostly examined using cross-sectional data (David & Han, 2004) resulting from “a single moment in time” (Kotabe & Mol, 2009). Yet, analytic evidence (e.g., Gray, Tomlin, & Roth, 2009) suggests that dynamic effects are prominent. Our study attempts to add empirical dynamic evidence, thereby shedding light on causal ordering as we separate over time the presence of financial and competence constraints, and changes in the use of outsourcing and process improvement. Specifically, we show that outsourcing has effects both within the same year and delayed effects, suggesting that studies which only consider contemporaneous correlates *underestimate* the enabling impact of outsourcing on process improvement. This is a useful advance given the many discussions on the costs and benefits of outsourcing. Moreover, we show that critical antecedents to outsourcing are present one or two years prior to observing outsourcing, which suggests that studies that only consider contemporaneous drivers of outsourcing also underestimate these. Moreover, this dynamic approach strengthens the internal validity of this study considerably beyond what cross-sectional data may offer.

The remainder of the paper is organized as follows. First, we develop theory and hypotheses regarding firm boundaries, constraints, and outsourcing as a potential enabling solution to overcome these constraints and realize process improvements. Then we proceed by introducing the data, variables, and dynamic empirical models. Lastly, we discuss the results and the implications of this study.

## 2. Theory and hypothesis development

Research on firm boundaries is one of the longest standing efforts in business research (Coase, 1937; Tsay et al., 2018). Firm boundaries are the borders between the firm and its environment (Santos & Eisenhardt, 2005) and these borders are determined by whether certain activities are performed internally (by the firm) or externally. Two widely used perspectives on how firm boundaries are determined are the efficiency view, predicated on transaction cost theory, and the capabilities perspective dominated by the resource-based view of the firm (Tsay et al., 2018).[3] These perspectives differ in the unit of analysis (transaction vs. firm) and their premises (Holcomb and Hitt, 2007).

The efficiency view takes a so-called perspective of fit or discriminating alignment (Williamson, 1985). At the heart of this view is a comparison of costs of inside vs. outside organization where firms choose for the alternative with the greatest cost efficiency. According to this perspective, the optimal organization of firm activities, and thus whether activities are performed internally or externally, is a function of exchange characteristics, such as asset specificity and frequency of exchange (e.g., Williamson, 1985), measurement difficulty (e.g., Poppo & Zenger, 1998), and transaction size and complexity (e.g., Anderson & Dekker, 2005). However, this perspective historically has put little emphasis on firm-specific characteristics (cf. Leiblein & Miller, 2003).

The resource-based view considers resources and capabilities in the form of skills, competences and know-how, which are at the heart of boundary-related decisions and explain performance differences between firms (Wernerfelt, 1984). Particularly, collaboration with external constituencies allows firms to gain access to resources and capabilities not available within the firm. Thus firms seek collaboration with partners that possess valuable resources which are difficult to obtain, imitate or substitute, in order to complement their own resource base. This theoretical perspective thus allows researchers to consider firm-level determinants of boundaries, including firm-specific resources and investments (Barney, 1999), contemporaneous firm-specific agreements (Argyres & Liebeskind, 1999), brand name reputation (Nayyar, 1990), competitive priorities (Gray, Roth, & Tomlin, 2009), and the magnitude of the skill set (Poppo & Zenger, 1998). While both perspectives are useful, as we discuss next, we know much less about firm-level constraints that can influence outsourcing decisions. Particularly, we develop the argument that in the presence of firm-level constraints, outsourcing can have important enablement benefits that allow firms to deal with those constraints and achieve internal improvements. These enabling effects are particularly linked to the resource-based view and derive from the access to another firm's resource base that outsourcing firms obtain. We develop our hypotheses in two steps, focusing first on the influence of firm constraints on outsourcing decisions, and then addressing the effects of those decisions on process improvement consequences.

### 2.1. Constraints and outsourcing

Extensive empirical research exists on the antecedents of firms' outsourcing decisions. Tsay et al. (2018) review prior research on the

[2] These refer to Australian tax years which span two calendar years. Surveys for Panel 1 were conducted from 2004/2005 until 2009/2010, and for Panel 2 from 2009/2010 until 2013/14. The reference period for the data is the tax year ending on the 30th of June. As in the first panel the outsourcing variable was not captured in the first year, this results in five years of data suitable for this study, with the first year of observations in 2005/2006.

[3] Tsay et al. (2018) provide a brief review of research on these perspectives on the theory of the firm.

antecedents of outsourcing which they map by characteristics relating to activity/product/process, firm, transaction, environment and decision maker. Some of the empirical work that adopts a firm-level perspective focuses on factors such as supplier capabilities (Cui, Loch, Grossmann, & He, 2012), strategy (Randall & Ulrich, 2001), production and sourcing experience (Leiblein & Miller, 2003), internal firm structure (Weigelt & Miller, 2013), and the presence of unions (Pagell & Handfield, 2000). Yet, a firm-level influence that is not frequently considered but critically affects, or even necessitates, outsourcing are the constraints faced by firms (Combs & Ketchen Jr, 1999). Constraints are firm-level negative and disruptive firm conditions and problems that adversely impact the activities of a firm and pose a risk to firm outcomes, putting pressure on managers and stimulating problem solving actions. Prior research supports this claim by showing that negative outcomes motivate managers to overcome problems, of which one option is to outsource (Morrow Jr, Sirmon, Hitt, & Holcomb, 2007).

The resource-based perspective on firm boundaries emphasizes that firms are not self-sufficient, inducing them to interact with the surrounding environment to access resources (Barringer & Harrison, 2000). Interfirm cooperation permits firms to share resources and overcome resource constraints to grow (Hamel, 1991). When facing constraints, support by business partners may thus enable firms to overcome their negative consequences. Practical evidence indeed points at outsourcing as a prominent way of accessing important enablement benefits through business partners by organizing operations outside the boundaries of the firm (Deloitte, 2019; Linder, 2004; Quinn, 1999).

Several characteristics of outsourcing make it attractive in accessing business partner enablement benefits to overcome the negative impact of firm-level constraints. Outsourcing is, on the one hand, a reasonably durable way of getting access to resources and efficiency. On the other hand, once in place, outsourcing can be a relatively flexible mechanism (Scherrer-Rathje, Deflorin, & Anand, 2014) as it allows firms to respond to dynamics in the environment and adapt to changing conditions by adjusting activities outsourced. Thus, for firms facing constraints, the expansion of firm boundaries through outsourcing could function as a viable enabling solution.

In this study, we focus on financial constraints and competence constraints. Financial constraints involve situations when, for example, inputs such as personnel are too costly or insufficient credit is available to be able to independently proceed with certain business activities. Competence constraints relate to a lack of critical competence-related resources that a firm needs to remain competitive, such as skilled human capital or key technologies. Our focus on both types of constraints enables us to address issues that are highly relevant for businesses and at the same time efficiency and resource perspectives are fundamental theoretical building blocks. Practitioner reports indeed suggest that cost efficiency and skills problems are top risk factors faced by firms (Ernst&Young, 2013), and find a significant proportion of firms to engage in outsourcing (Deloitte, 2019). Despite the recognition of such constraints potentially exerting a key influence on outsourcing decisions (Combs & Ketchen Jr, 1999), not much empirical research has examined this influence, nor of the performance consequence when outsourcing decisions are made under constraints.[4]

Regarding financial constraints, outsourcing can have important enabling effects by allowing to shift existing (and possibly inefficient) operations outside the firm to reduce financial demands and transform its cost structure. This is made possible as outsourcing partners may perform activities at a lower cost, for instance because of their economies of scale, investments in new technologies and innovations (Jiang & Qureshi, 2006), flexible management and work practices, and better allocation of capacity (Alexander & Young, 1996). Practically, financial constraints may also make operations that could previously be done internally inefficient, for example because the firm's cost of capital increases. In addition, outsourcing enables the organization of new activities and processes without having to invest in costly and risky assets. For example, outsourcers can benefit from new or emerging technologies without investing considerable capital in those technologies (Leiblein, Reuer, & Dalsace, 2002). This is particularly valuable when a firm lacks the financial resources or access to capital necessary to make such investments. Thus, we hypothesize that:

**Hypothesis 1.** Financial constraints induce firms to increase outsourcing.

Additional to potentially enabling the alleviation of financial constraints, outsourcing can also enable the resolution of competence constraints. This is facilitated by obtaining access to required skills and technologies which outsourcing partners possess, such as knowledge, patents and licenses that allow the outsourcing party to use superior technologies and know-how. From a resource-based perspective, access to other firms' resources and capabilities (e.g., skills, competencies, know-how), is central to firm boundary decisions and performance (Barney, 1999; Wernerfelt, 1984). Prior research on outsourcing indeed demonstrates that outsourcing not only can contribute to reducing costs (e.g., Dyer & Ouchi, 1993; Leiblein et al., 2002), but also facilitates access to partners' knowledge and expertise (e.g., Leiblein et al., 2002). Such access will be of particular value to the firm when internal competence constraints hamper firm activities and performance. Thus, we also hypothesize a positive impact of competence constraints on outsourcing as means of firm enablement:

**Hypothesis 2.** Competence constraints induce firms to increase outsourcing.

### 2.2. Process improvement consequences of outsourcing

Despite the expectation that firms will use outsourcing as enabling mechanism in their attempts to overcome constraints, its performance implications are unclear. The performance impact of outsourcing is a highly debated topic supported with empirical evidence that highlights both advantages and drawbacks (e.g., Tsay et al., 2018). Among the disadvantages, empirical studies have examined potential opportunism (Handley & Benton Jr, 2012), reduced control over firm activities and capability losses (Handley, 2012), quality failures (Steven, Dong, & Corsi, 2014), and a loss of R&D competitiveness (Teece, 1988). Key advantages include that outsourcing provides numerous opportunities to enhance performance through efficiency and competence gains (Quinn, 1999). We examine a specific, but important, outcome measure that directly relates to an enabling impact of outsourcing on the firm's operations, namely improvements in internal processes (Tsay et al., 2018). Process improvement captures transformations and developments in practices of organizing internal operations, including improvements in work organization practices, production and service provision methods.

One perspective is that outsourcing can enable improvements in firm processes through the elimination of inefficient operations and by triggering deeper changes of organizational and operational processes. Such changes and developments can be stimulated and facilitated through access to ideas and knowledge of outsourcing partners (e.g., Laursen & Salter, 2006). For example, outsourcing parties often work closely together, such as through representatives from the outsourcing partner embedded at the outsourcer's location, which facilitates the exchange and implementation of novel ideas. Outsourcing to business partners can improve resource allocation and enable efficient restructuring of internal firm processes and costs by allowing focus on a narrower scope of activities (Quinn, 1992). In addition, it can free up resources (Santos & Eisenhardt, 2005) that can be directed towards improving internal processes, which is of particular importance when

[4] In contrast, prior research has examined how outsourcing may result in firm constraints, particularly through capability losses over time that can reduce outsourcing performance (Handley, 2012).

facing critical constraints. Thus, an increase in outsourcing can prompt improvements in the firm's internal processes.

A contrary perspective is that outsourcing under constraints may be inefficient (Combs & Ketchen Jr, 1999) as those constraints may indicate a lack of ability to understand and evaluate outsourced tasks, which adversely influences outcomes (Parmigiani & Mitchell, 2009). While outsourcing may help firms under pressure to survive, unavoidable inefficient governance choices (e.g., suboptimal governance forms and weak contracts relative to exchange characteristics) could exacerbate adverse consequences of outsourcing, such as reduced control over operations and the loss of R&D competitiveness (Teece, 1988). While this creates ambiguity on the influence of outsourcing on process improvement, we nevertheless expect the positive effect to dominate as a foresighted firm will likely factor the additional costs of outsourcing under less favorable conditions into its decision to seek enablement benefits of business partners. Thus, we hypothesize that outsourcing will, on average, result in positive changes in firm processes:

**Hypothesis 3.** Increased outsourcing motivates (a) contemporaneous and (b) subsequent process improvement.

## 3. Method

### 3.1. Data

Testing our hypotheses requires longitudinal data on financial and competence constraints, outsourcing, and process improvements. The Business Longitudinal Databases (BLD) developed by the Australian Bureau of Statistics (ABS) meets these requirements and combines data from the multi-purpose Business Characteristics Survey (BCS) conducted by the ABS and financial information provided by the Australian Taxation Office (ATO). We use two BLD databases for testing our hypotheses: the first covering firms observed over the period 2005/2006–2009/2010, and the second covering another set of firms observed over the period 2009/2010–2013/2014. Using longitudinal data enables separating the independent and dependent variables over time to improve causal inference. Moreover, the use of multi-source data overcomes some common sources of method bias (Podsakoff, Mackenzie, and Podsakoff 2012). Finally, using two independent panel datasets including longitudinal data of two large samples of firms allows us to test the stability of identified associations over time and reduces concerns of panel attrition.[5]

The population for the BCS survey includes all Australian businesses with up to 200 employees and excludes large and complex firms for confidentiality reasons as these may be more easily identified. From this population the ABS applied a random stratified sampling design over a five-year window resulting in 3432 firms for Panel 1 and 2011 firms for Panel 2. The strata in the panels include randomly selected firms from each industry group of the Australian and New Zealand Standard Industrial Classification (ANZSIC). The panels include firms with up to 200 employees active in the Australian economy, defined as firms registered for an Australian Business Number (ABN) and that remit Goods and Services Tax (GST). The names of the firms and their mailing addresses for surveys are sourced from ATO registers and other administrative data sources. To allow for a representative sample, businesses were compelled to participate in the data collection under the Census and Statistics Act of 1905 and can be fined for failing to provide the required information. The ABS mandates provision of accurate information by the informant and checks validity and consistency of received responses, for example by correlating responses to archival data. Firms up to 200 employees are highly relevant for our analysis because they are more likely to be significantly affected by negative firm conditions in that internal resources, expertise, or knowledge are more limited and absorptive buffers may be lacking (Anderson & Dekker, 2005).[6] The BCS also contains detailed yearly information on firm characteristics, activities and outcomes. Financial information on the firms participating in surveys is provided by the ATO from its tax records.

The BLD databases that comprise these two data sources thus provide us with highly relevant samples for testing our predictions and we have been provided with access to these data under strict conditions. Importantly, the databases are designed by the ABS to allow longitudinal analysis of firms' activities that influence business performance and business characteristics that are associated with these activities,[7] which makes the design of the databases highly appropriate. Additionally, the BLD contains data not only about the presence of certain conditions and processes within the firms but also on changes in elements such as firm conditions, use of outsourcing, and outcomes. The longitudinal nature of the data helps to draw stronger conclusions about the predicted relationships than cross-sectional data would allow.

### 3.2. Variable measurement

Variable definitions of the BLD are determined to aid government policy and policy evaluation, ranging from, for example, an evaluation of job growth and innovation in SME's to efficiency differentials between exporting and non-exporting firms. Given the range of aspects the database needs to potentially inform on, a requirement for ease-of-administration, and a requirement to keep items consistent over time and countries, measurement does not follow the more traditional measurement tradition in marketing of multiple Likert scale items. Instead single binary indicators are used and four-point scales. The benefits of this are well-documented in the innovation domain and their use is commonly accepted by national bureaus of statistics (e.g., Laursen & Salter, 2006). Moreover, the items are important in themselves in that they form the basis of government statistics and potentially decision-making. We now turn to discussing measurement in detail. Table 1 lists all items and response formats.

*Outsourcing* is measured through a survey question that asks whether within the tax year contracting out work and activities or outsourcing decreased, stayed the same or increased compared to the previous year.[8] Because of strict model limitations imposed by the ABS (i.e., we can only use panel logit models), we transformed this into a binary variable that takes the value of one when firms increased their outsourcing and zero when not increasing outsourcing.[9] The “not applicable” category is excluded from analysis. While this choice results in a reduction of the sample size for both panels, it does provide us with samples in which outsourcing is relevant and may (or may not) have increased.

*Financial constraints* relate to whether costs of inputs or access to financial resources significantly hampered business activities or performance of the firm and, as such, are firm-level negative and disruptive firm conditions and problems that adversely impact the activities of a

[5] Note that these are separate databases and that it is not possible to run one analysis over the whole dataset due to restrictions imposed by the ABS.

[6] We dropped firms from the analyses without any employees as their activities are performed outside per definition and are therefore not relevant for the issues that we study.

[7] http://www.abs.gov.au/ausstats/abs@.nsf/Products/8168.0.55.002~2004-05+to+2009-10~Main+Features~Introduction?OpenDocument.

[8] The terms outsourcing and contracting out activities are used interchangeably.

[9] We transform this (and some other) variables into a binary format due to the technical restrictions imposed by the ABS, which limits us to using Stata 10 without user-installed packages. From this set of commands, the ABS excludes a lengthy list of further commands, to avoid the potential for revealing the identity of the firms involved. Of main importance to our analysis is that only panel logit commands can be used and not panel ordinal logit commands. Therefore, we dichotomize certain variables as discussed.

**Table 1**
Variable measurement.

| Construct | Items |
|---|---|
| **Outsourcing**<br>Transformed into a binary format (0 = stay the same; 1 = increase) | Compared to the previous year, did contracting out work/activities or outsourcing decrease, stay the same or increase? (0 = not applicable, 1 = decrease, 2 = stay the same, 3 = increase) |
| **Financial constraints**<br>Average of 4 items | 1. Did lack of access to additional funds significantly hamper innovation? (0 = no, 1 = yes)<br>2. Did cost of development or introduction/implementation significantly hamper innovation? (0 = no, 1 = yes)<br>3. Did lack of access to additional funds significantly hamper other business activities[a] or performance? (0 = no, 1 = yes)<br>4. Did cost of inputs significantly hamper other business activities or performance? (0 = no, 1 = yes) |
| **Competence constraints**<br>Average of 3 items | 1. Did lack of skilled persons within the business significantly hamper innovation? (0 = no, 1 = yes)<br>2. Did lack of access to knowledge or technology significantly hamper innovation? (0 = no, 1 = yes)<br>3. Did lack of skilled persons within the business significantly hamper other business activities or performance? (0 = no, 1 = yes) |
| **Process improvement**<br>Average of 6 items taken. Resulting variable is transformed into a binary format (0 = no process improvement, 1 = improved processes) | Did this business introduce any new or significantly improved operational processes?<br>1. Methods of manufacturing or producing goods or services (0 = no, 1 = yes)<br>2. Supporting activities for business operations (0 = no, 1 = yes)<br>3. Other operational processes (0 = no, 1 = yes)<br>Did this business introduce any new or significantly improved organisational/managerial processes?<br>1. Knowledge management processes (0 = no, 1 = yes)<br>2. Major change to the organisation of work (0 = no, 1 = yes)<br>3. Other organisational/managerial processes (0 = no, 1 = yes) |
| **Firm size** | Total sales (natural logarithm) |
| **Firm type**<br>4 categories | Type of legal organisation<br>(registered company – base category; sole proprietor; partnership; trusts and other unincorporated identity) |
| **Industry**<br>12 categories | Industry division according to Australian and New Zealand Standard Industrial Classification (ANZSIC)<br>(Agriculture, Forestry and Fishing – base category) |
| **Year**<br>5 categories | Financial years from using the first year (either 2005/2006 or 2009/2010) as the base category |

[a] Other business activities - all firm's activities except for innovation activities.

firm. We take the average of four measurement items as the construct measure. The first item asks whether within the year lack of access to additional funds significantly hampered innovation. The second item asks if cost of development or introduction/implementation significantly hampered innovation. The third item asks whether lack of access to additional funds significantly hampered other business activities or performance. The fourth item asks if cost of inputs significantly hamper other business activities or performance.

*Competence constraints* are a perceived lack of skills and knowledge resources within the firm and, as such, are firm-level negative and disruptive firm conditions and problems that adversely impact the activities of a firm. We take the average of three measurement items as the construct measure. The first item asks whether innovation activities of the firm were significantly and adversely affected by the lack of skilled persons within the business. The second item asks whether innovation activities of the firm were negatively influenced by the lack of access to knowledge or technology. The third item asks whether other business activities and performance of the firm were negatively influenced by a lack of skilled persons within the business.

*Process improvement* is indicated by the introduction of new or significantly improved managerial and operational processes. We use six binary variables that explicitly relate to firm processes and capture improvements in 1) methods of manufacturing or producing goods or services, 2) supporting activities for business operations, 3) other operational processes, 4) knowledge management processes, 5) major change to the organization of work, and 6) other organizational/managerial processes. We combine these items into one construct measure following earlier work (e.g., Abernethy, Dekker, & Grafton, 2020; Mooi, Wathne, & Kayande, 2016) and that the ABS has defined this as a single scale. Given an inability to estimate ordinal panel models due to ABS limitations, this variable is transformed into a binary variable that takes the value of one when at least one of the six types of process improvements was introduced and value zero when no process improvement was introduced.

#### 3.2.1. Control variables

In addition to the focal theoretical variables we included several control variables that may affect the propensity of firms to engage in outsourcing and/or experience process improvement. Firm size is measured as the log of total sales and taken from the BLD. Larger firms tend to have greater resources (Weigelt & Miller, 2013), which may impact outsourcing decisions but also their changes to internal processes. We also control for firm type, as the type of legal organization may influence outsourcing decisions (i.e., registered company, sole proprietor, partnership, trust or other type of legal organization). In addition, we add industry fixed effects as these are the strata on which the sampling design is based. We add year fixed effects to absorb unobserved heterogeneity and to accommodate potential endogeneity bias resulting from omitted differences across years, such as economic changes.

### 3.3. Descriptive statistics

Tables 2 and 3 provide descriptive statistics of and correlations between the variables used.[10] Descriptive evidence for Panel 1 shows that 18% of the observations reveal financial constraints and 12% of firms reports on competence constraints. The percentages are similar in

[10] In Table 2, descriptive statistics are based on observations that have a score on the outsourcing item (i.e., observations reporting not applicable on this item, which indicates no outsourcing, are not included).

**Table 2**
Descriptive statistics for Panel 1 and Panel 2.

| Variable | N | Min | Max | Frequency *zero* values | Frequency *non-zero* values | Mean | SD |
|---|---|---|---|---|---|---|---|
| Panel 1: Descriptive statistics for Panel 1: 2005/2006–2009/2010 | | | | | | | |
| Increase in outsourcing | 2821 | 0 | 1 | 2115 | 706 | 0.25 | 0.43 |
| Financial constraints | 2812 | 0 | 1 | 1765 | 1047 | 0.18 | 0.29 |
| Competence constraints | 2812 | 0 | 1 | 2142 | 670 | 0.12 | 0.24 |
| Process improvement | 2817 | 0 | 1 | 1757 | 1060 | 0.12 | 0.19 |
| Firm size | 2753 | 2.149 | 9.121 | 0 | 2753 | 6.14 | 0.83 |
| Panel 2: Descriptive statistics for Panel 2: 2009/2010–2013/2014 | | | | | | | |
| Outsourcing | 2175 | 0 | 1 | 1653 | 522 | 0.24 | 0.42 |
| Financial constraints | 2173 | 0 | 1 | 1302 | 871 | 0.20 | 0.29 |
| Competence constraints | 2173 | 0 | 1 | 1664 | 509 | 0.13 | 0.25 |
| Process improvement | 2175 | 0 | 0.71 | 1303 | 872 | 0.11 | 0.17 |
| Firm size | 2125 | 4.139 | 8.649 | 0 | 2125 | 6.22 | 0.78 |

Panel 2 (20% vs. 13%). We also observe in the two panels that in 25% and 24% of the firm-year observations an increase in outsourcing is reported. How firms try to deal with financial and competence constraints through enablement by outsourcing is the subject of our model and analysis section. Reported process improvements are again similar across both panels and occur relatively infrequently (0.12 versus 0.11). The other correlations reported in Panels A and B of Table 3 are also comparable in size and direction and the low to medium-sized correlations suggest no multicollinearity.

### 3.4. Models and analysis

Characteristics of the available samples, the dependent variables, and limitations imposed by the ABS guide the choice of data analysis. First, we have repeated firm observations, necessitating the use of a panel estimator. Second, guided by the availability of logit panel models only (instead of ordinal logit panel models), we created binary outcome variables for outsourcing and process improvement (Long & Freese, 2006). Third, controlling for industry and year fixed effects absorbs unobserved heterogeneity, which is often a critical threat to inference. Fourth, and finally, we need to include lagged variables to test our hypotheses. For the outcomes, time t0 indicates contemporaneous specification, while t + 1 indicates a one-year lag. For the independent variables, the models we specify include change variables as well as time lags. Both an increase in outsourcing and process improvement are change variables as they indicate a change in outsourcing and change in processes, relative to the prior year. While the nature of the data allows us to only lag intervals of one year, these are reasonable lags given that outsourcing activities in response to constraints may involve significant time for decision making and thus not necessarily take place within the same year that firms face such constraints. In our analyses, we therefore examine both contemporaneous and lagged effects. Taking these criteria in consideration, our first model to be examined is specified as:

$$\text{Increase in outsourcing}_{it} = \alpha + \beta_{it}\,\text{Financial constraints} + \beta_{it}\,\text{Competence constraints} + \text{Controls} + \varepsilon \quad (1)$$

where i refers to each firm and t to the time period. We estimate this, and other models, using random effects as we are interested in studying all available variation as there are a) between-firm differences in outsourcing and process improvement, and b) the same firm can make different choices over time. As the hypotheses predict that an increase in outsourcing due to firm constraints motivates performance improvements, we test this using model (2), which allows for both contemporaneous and subsequent effects of an increase in outsourcing:

$$\text{Process improvement}_{it} = \alpha + \beta_{it}\,\text{Increase in outsourcing} + \beta_{it}\,\text{Financial constraints} + \beta_{it}\,\text{Competence constraints} + \varepsilon \quad (2)$$

Based on the measurement level of the dependent variables, for model (2) we use logistic panel regression.

## 4. Results

### 4.1. Main analysis

Table 4 provides results of testing our hypotheses for the two data

**Table 3**
Pearson correlations among the model variables for Panel 1 and Panel 2.

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Panel 1: Pearson correlations among the model variables for Panel 1: 2005/2006–2009/2010 | | | | | | |
| 1 | Outsourcing | – | | | | |
| 2 | Financial constraints | 0.02 (2812) | – | | | |
| 3 | Competence constraints | 0.08** (2812) | 0.22** (2812) | – | | |
| 4 | Process improvement | 0.15** (2817) | 0.20** (2808) | 0.16** (2808) | – | |
| 5 | Firm size | 0.04* (2753) | −0.06** (2744) | 0.11** (2744) | 0.20** (2749) | – |
| Panel 2: Pearson correlations among the model variables for Panel 2: 2009/2010–2013/2014 | | | | | | |
| 1 | Outsourcing | – | | | | |
| 2 | Financial constraints | 0.06** (2173) | – | | | |
| 3 | Competence constraints | 0.07** (2173) | 0.29** (2173) | – | | |
| 4 | Process improvement | 0.13** (2175) | 0.21** (2173) | 0.21** (2173) | – | |
| 5 | Firm size | 0.06** (2125) | −0.05** (2123) | 0.07** (2123) | 0.23** (2125) | – |

In each cell, the pairwise Pearson correlation and number of observations (in parentheses) is listed. Correlations are contemporaneous and indicative only for binary and ordinal variables.

* $p < .05$.

** $p < .01$ (two-tailed).

**Table 4**
Predictors of outsourcing.

| | Panel 1: 2005/2006–2009/2010 | | | Panel 2: 2009/2010–2013/2014 | | |
|---|---|---|---|---|---|---|
| | Outsourcing (t0) | Outsourcing (t+1) | Outsourcing (t+2) | Outsourcing (t0) | Outsourcing (t+1) | Outsourcing (t+2) |
| Financial constraints (t0) | 1.224 (0.275) | 1.528 (0.422) | 1.713 (0.583) | 1.554* (0.389) | 2.260*** (0.652) | 3.290*** (1.156) |
| Competence constraints (t0) | 1.876** (0.465) | 2.182*** (0.646) | 1.967* (0.718) | 1.806** (0.493) | 0.998 (0.346) | 1.281 (0.517) |
| Firm-size | 1.131 (0.110) | 1.035 (0.116) | 0.899 (0.120) | 1.241* (0.136) | 1.249* (0.167) | 1.150 (0.171) |
| Firm-type fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Model $\chi^2$ | 85.61 | 61.99 | 43.33 | 60.40 | 52.27 | 42.03 |
| *p* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| n | 2744 | 2109 | 1518 | 2123 | 1644 | 1199 |

Models are estimated using logistic regression. Cells show odds ratio (OR) and standard errors (in parentheses).
All significance tests are two-tailed.
* $p < .10$.
** $p < .05$.
*** $p < .01$.

panels. H1 and H2 predict an association between occurrence of financial and competence constraints and increased outsourcing. Model 1 that tests this association for Panel 1 is statistically significant ($p < .01$). Results support H2 indicating that firms facing competence constraints are more likely to subsequently increase outsourcing than firms not facing such constraints. This holds for both the same year that such constraints are present as for the two subsequent years, indicating that outsourcing to overcome competence constraints through enablement by business partners can be a process that potentially spans several years (now, t+1 and t+2). At the same time, our tests in Panel 1 do not provide support for H1 that predicts an association between occurrence of financial constraints and increased outsourcing. On the other hand, in Panel 2 that covers the years 2009/2010–2013/2014, financial constraints are associated with contemporaneous and future outsourcing. Moreover, in this panel, competence constraints are associated with outsourcing in the same year while the coefficient for subsequent periods is insignificant. Jointly, these findings indicate that both financial constraints and competence constraints are associated with outsourcing and that this influence is both contemporaneous and lagged. This suggests that the role of outsourcing as enabling mechanism may differ depending on the circumstances that firms face and the alternative options they have for overcoming such constraints.

H3 predicts a positive association between outsourcing and contemporaneous and future process improvement. In the model estimations, we include effects of changes in outsourcing (t0) on contemporaneous (t0) as well as future (t+1) process improvement while controlling for financial and competence constraints in the base period (t0) that we found to influence outsourcing. These specifications enable to test the effects of outsourcing as taking place across time. The results reported in Table 5 provide support for H3 as they identify contemporaneous and future positive effects of outsourcing on process improvement, which indicate that part of the enabling benefits of outsourcing takes times to materialize (e.g., due to initial setup costs).

In sum, we find that firm-level constraints drive outsourcing to business partners. Over time this outsourcing enables firms in improving their internal processes (compared to firms not engaging in (greater) outsourcing). In addition, controlling for direct effects of financial and competence constraints, and thus for their direct effects on process improvement and potential use of other mechanisms to resolve such constraints, our results provide evidence that outsourcing is a viable enabling mechanism of overcoming constraints and enhancing performance.

### 4.2. Additional analyses

#### 4.2.1. Endogeneity

We considered the presence of endogeneity with regard to outsourcing. Theoretically, such endogeneity may be present as firms may outsource inefficient tasks strategically in order to improve performance. However, when outsourcing takes place under adverse conditions, performance can worsen, making it less clear what effect is most likely to result (Combs & Ketchen Jr, 1999; Williamson, 1985). Nevertheless, we tested for endogeneity empirically using the approach advocated by Heckman (1979) as our outsourcing variable is binary. We modified the approach to also account for the dependent variable being binary. Specifically, we used a binary treatment regression model with as an instrument indicating firm age. While firm age may relate to firm performance, our dependent variable considers process improvement and is therefore dynamic. Empirically, firm age is indeed unrelated to process improvement ($p > .10$), while it relates negatively to outsourcing ($p < .05$). This makes sense as older firms may be better able to deal with constraints, reducing the need to outsource and satisfying the relevance assumption of instruments. The conclusion of our analysis, based on the indicator of endogeneity (the inverse Mills ratio), dispels the concern about endogeneity ($p > .10$).

#### 4.2.2. Additional lags between the model variables

Consistent with the time lags specified in the models in Table 4, we also ran additional models in both data panels with different time lags between process improvement, firm constraints and outsourcing. Specifically, we ran models with a two-year lag between process improvement (t+2) and financial and competence constraints (t0), with outsourcing having either a one-year (t+1) or two-year (t+2) time lag. Results and inferences for the effects of outsourcing on process improvement in these models (untabulated) are comparable to those reported in Table 5.[11] These additional tests indicate that our results regarding the estimated effect of outsourcing on process improvement do not depend on the time lag specified for financial and competence constraints.

#### 4.2.3. Interactions between financial constraints and competence constraints

Firms facing disruptive constraints often suffer from wide array of problems which potentially reinforce each other. For example, high costs and a lack of skilled employees may interact in how they impact outsourcing as enabling mechanism by providing firms with greater urgency. Therefore, we add an interaction term between financial and competence constraints to Eqs. (1) and (2). Untabulated tests results do not support such an interaction ($p > .10$ in both panels).

[11] In both specifications and data panels, financial constraints at t0 are significantly associated with process improvement at t + 2, while the coefficients of competence constraints at t0 are insignificant.

**Table 5**
Process improvement outcomes of outsourcing.

| | Panel 1: 2005/2006–2009/2010 | | Panel 2: 2009/2010–2013/2014 | |
|---|---|---|---|---|
| | Process improvement (t0) | Process improvement (t+1) | Process improvement (t0) | Process improvement (t+1) |
| Financial constraints | 4.192*** (0.819) | 2.874*** (0.714) | 5.324*** (1.304) | 2.817*** (0.747) |
| Competence constraints | 1.946*** (0.426) | 2.054*** (0.565) | 3.948*** (1.043) | 2.037** (0.603) |
| Outsourcing | 1.975*** (0.243) | 1.323* (0.204) | 1.716*** (0.257) | 1.521**(0.252) |
| Firm-size | 2.204*** (0.195) | 2.231*** (0.261) | 2.423*** (0.273) | 2.474*** (0.318) |
| Firm-type fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Model $\chi^2$ | 229.79 | 98.68 | 187.79 | 115.08 |
| *p* | 0.00 | 0.00 | 0.00 | 0.00 |
| n | 2740 | 2095 | 2123 | 1656 |

Models are estimated using logistic panel regression. Cells show odds ratio (OR) and standard errors (in parentheses).
All significance tests are two-tailed.
* $p < .10$.
** $p < .05$.
*** $p < .01$.

## 5. Discussion

Firms can outsource for a multitude of reasons. Whilst much is known about efficiency reasons to outsource, our results show that outsourcing can play a key role as enabling approach that facilitates firms in dealing with financial and competence constraints. These adverse conditions create the dilemma of whether resource constraints are countered by outsourcing, enabling better performance, or whether they complicate the management of outsourcing and reduce performance.

First, both data panels show that firms facing competence constraints are inclined to *increase* outsourcing. For competence constraints, we observe significant positive associations with both contemporaneous and future outsourcing (t+1 and t+2) in panel 1, as well as a contemporaneous association with outsourcing in panel 2. For financial constraints, we do not find significant associations with outsourcing in panel 1 but do observe these in panel 2 for both contemporaneous and future outsourcing (t+1 and t+2). Our results thus show an important nuance to prior research on the determinants of outsourcing in that constraints that firms are facing seem to foster outsourcing. Whereas prior work identified exchange level attributes as the drivers of outsourcing (cf. Geyskens et al., 2006), we show that firm attributes in the form of resource constraints also matter. A key implication is that studies that focus on exchange attributes should also consider the identity and characteristics of the outsourcing party. Moreover, whereas much of the previous work has used exchange attributes for the make (insource) or buy (outsource) decision, we consider how the "pendulum" between make and buy shifts in a context where firms already make *and* buy, and are in need of greater enablement to overcome constraints. A related implication of this finding is that our empirical results strongly suggest that the drivers of outsourcing as enabling approach may take one or even two years to result in outsourcing. One implication is that work that only considers contemporaneous effects, such as through cross section surveys, risks underestimating the drivers and effect of outsourcing. Consider for example the effect of competence constraints on outsourcing in panel 1 where the coefficient estimates for instant and t+1 plus t+2 effects are each around 2. This suggests that if we only consider the contemporaneous effect, we *only observe a third of the total effect* (t0 effect of 1.875 divided by the summed effects across the 3 years of t0 (1.875), t+1 (2.1810 and t+2 (1.967)).[12]

Second, these outsourcing decisions are of critical importance to firms in that this enables achieving improvements in processes that may unlock further financial performance improvements further down the line. Given the contradictory views on this, with a body of literature arguing constraints may indicate a lack of ability to understand and evaluate outsourced tasks, adversely influencing outcomes (Parmigiani & Mitchell, 2009), and a body arguing for positive effects, we find support for the *latter* thesis and show that *changes* to outsourcing matter for process improvement. This is something which prior work, to the best of our knowledge, has not shown. Moreover – and opposed to studies that compare the effects of outsourcing in a cross-section on performance – we compare specific outcomes in a panel setting where outsourcing changes across years and do so using data of two large scale surveys that together span a decade of evidence. Note as well that the enabling effects of outsourcing on process improvement are underestimated when taking a cross section, as we observe such improvements to not be confined to the period of increased outsourcing but also occur in the year after.

## 6. Practical implications

This research holds several practical implications. From a policy perspective, we note that the Australian business community seems to have developed at least one response to difficulties following from internal lack of financial and non-financial resources. The outsourcing choices that we observe spanned the total period of data collection, and seemed to have at least partially promoted process improvement. Many advanced economies, among which Australia, are characterized by a "productivity puzzle", in which the rate of converting inputs to outputs has remained stagnant. Our results point to at least some perceived improvement during both panels, particularly for firms using outsourcing as response to an internal lack of critical resources. The observation of continued improvement in the second panel (2009/2010–2013/2014) stands out as most economists (e.g., see https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/whatistheproductivitypuzzle/2015-07-07) agree the productivity puzzle was most prevalent during that particular time period.

For managers our results hold several key implications. For example, managers facing key resource shortages, whether of financial or non-financial origin, may struggle to find a response from *within* the organization. Our result suggests that a response from *outside*, in the form of outsourcing, allows firms to at least partially offset some of these resource shortages as reflected in process improvements. We also note that these effects are robust, both across the different types of legal organization of sample firms and the industry these firms operate in, and remain when accounting for potential year differences.

[12] Note that as these effects pertain to the same variable (albeit over time) scaled on the same metric, coefficients can be compared. Effects from t + 3 onwards are not significant (results untabulated), implying these should not be added to the calculation as they are statistically indifferent from zero.

## 7. Limitations

This study is subject to several limitations. One such limitation, shared with other large-scale government data collection efforts, is that we cannot speak to the exact routes which influence outsourcing and process improvement as the data lacks this level of granularity. Whilst we find strong evidence of relationships between these variables, qualitative or experimental research could shed a more detailed light on the process arguments we offer and support (or reject) their validity.

Another limitation is that we cannot separate out any actual constraints, such as a bank refusing a loan or a job offer to a particularly skilled person that was turned down, and instead focus on perceived constraints. Our measurement of perceived constraints does correlate with changes in outsourcing, suggesting reasonable nomological validity.

Our variable measures, albeit collected and designed carefully by the ABS, are mostly binary. A downside of such measures is that these do not show as much variance as measures that offer a greater range of responses. However, the reduction of variance also suggests that we likely underestimate some of the effects obtained and thus suggest somewhat conservatively estimated effects.

Finally, although results show that outsourcing can be a viable and beneficial enabling approach to overcoming existing problems, the scope of this study does not include alternative mechanisms of problem-solving (e.g., divestments, strategic or business model changes). Future research may address this issue and compare outsourcing and other ways of resolving constraints, including opportunities of in-house problem solving. A combination of both efficiency and resource-based arguments could inform a potentially productive research approach (Carter & Hodgson, 2006).

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