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Re-thinking SME disadvantage in public procurement

Purpose – This study investigates the relationship between firm size, resources, capabilities and involvement in public procurement. While the liability of smallness has been a recurring theme in research into public sector suppliers, there remains a dearth of evidence and theorising on the effects of size.

Methodology – A model linking firm size, resources, capabilities, tendering activity and performance is devised. Resource-based View (RBV) theory informs the model. Survey data from over 3000 firms active in the Irish public sector marketplace is used to test the model.

Findings – As hypothesised, firm size is positively associated with tendering resources and capabilities. Resources and capabilities, in turn, influence tendering activity and performance. Specifically, resources act as enablers for the number and value of contracts firms tender for while capabilities are important for winning contracts. We also find similarities between medium and large enterprises in their ability to tender.

Research limitations – The treatment of tendering resources and capabilities is not exhaustive. Future research could include additional indicators of resources (e.g. external consultants, IT) and capabilities (e.g. production, process innovation).

Practical implications – Managers of micro and small suppliers should focus on augmenting their tendering capabilities as they lag bigger suppliers. Legislators need to re-assess current “one-size-fits-all” SME-friendly policy as it is not sensitive to intra-SME differences.

Originality/value – This study introduces an important qualification into understanding of public sector suppliers by demonstrating that SME disadvantage is less black and white than shades of grey.

Keywords Public sector, SMEs, Tendering, Resources, Capabilities

Paper type Research paper

Introduction

The liability of being a small supplier in the public sector marketplace is a cross-cutting theme in procurement research. Over the past 25 years numerous academic studies and government reports have addressed the question of why small and medium enterprises (SMEs) struggle to compete for and win business with public sector organisations (see Loader, 2013 for a full review). As a result of these studies and reports we know that public procurement is challenging for SMEs on multiple levels and that there are no easy solutions to their under-representation. Problems include not only bureaucratic tendering systems and onerous qualification criteria (Fee *et al.*, 2002; Loader, 2015) but also excessive risk aversion on the part of public buyers (Cabras, 2011) and a public sector marketplace that operates in ways unfamiliar to many small firms (Greer, 1999).

Focusing on SMEs' difficulties has helped direct scholarly attention to the current state of the public sector marketplace and what needs to change to make it less skewed towards large enterprises (e.g. Knutsson and Thomasson, 2014; Walker and Preuss, 2008). At the same time it has prompted governments to reform public procurement and make it more inclusive of smaller and younger suppliers, as recent analysis by the OECD (2013) of its members' administrative systems demonstrates. But it has also come with a downside. Barring a few exceptions, it has led researchers to frame the debate on public procurement as one of struggling SMEs versus dominant large firms (Flynn *et al.*, 2015). The same criticism applies to contemporary procurement policy, which typically treats the SME cohort of the enterprise population as uniformly disadvantaged relative to large firms and deserving of support on this basis. The European Commission's (2008) Code of Best Practices Facilitating Access by SMEs to Public Procurement Contracts is a case in point.

The inevitable result of defining SMEs against large firms is that the former comes to be depicted in monolithic terms (Pett *et al.*, 2012). Differences within the SME population are downplayed and commonalities exaggerated. This phenomenon certainly characterises public procurement. SMEs are generally understood to be hindered by barriers that are the same in type and magnitude regardless of their size, age, industry, ownership structure or strategic positioning. What is more, SMEs are assumed to possess similar stocks of resources and capabilities for tendering and, by implication, achieve similar results. Yet such assumptions of SME homogeneity start to look suspect when one considers that SME is an umbrella term for micro, small and medium enterprises and accounts for 99 per cent of all business entities in the EU. Findings to emerge from recent studies provide further cause for scepticism. They identify differences between micro, small and medium enterprises in respect of their capacity to tender (Flynn *et al.*, 2015; Karjalainen and Kempainen, 2008) and number and value of contracts won (PwC, 2014).

The purpose of this study is to move beyond the SME versus large firm dichotomy by providing a more fine-grained analysis of the relationship between enterprise size and involvement in the public sector marketplace. To this end, our paper uses primary survey data from over three thousand suppliers to test the relationship between firm size and ability to tender for and win public contracts. It adds to the existing body of scholarship in two main ways. Empirically, it cross-compares micro, small, medium and large enterprises in respect of their resource base for tendering. To our knowledge, no previous study has simultaneously analysed these four size groups in this way. It then probes inter-relationships between the resource base and

indicators of tendering activity and performance. Theoretically, it takes a resource-based view (RBV) of firm involvement in public procurement. This too is novel and goes some way towards addressing the paucity of theory in research at the intersection of SMEs and public procurement.

The structure of the paper is as follows. Section two puts forward a conceptual model that links firm size, resource base for tendering, tendering activity and performance. The model is informed by RBV theory. Section three provides details on the research design. Relevant here is operationalisation and measurement of the variables, data collection, data screening and preliminary data analysis. Section four tests the conceptual model and presents the results. Section five discusses the import of the results in light on what is currently known about SME and large firm involvement in public procurement. Implications for research and practice are articulated. The paper concludes with an acknowledgement of its limitations as well as suggestions for how these can be addressed.

Literature review

Public procurement is a significant marketplace for private sector firms, accounting for 13% of GDP and 29% of government expenditure, on average, across developed economies (OECD, 2013). In monetary terms this equates to £242 billion in the UK and approximately €1,900 billion in the EU, to give but two illustrations. Public contracts are attractive to private sector firms for a number of reasons. For a start, they represent a predictable and stable source of demand (Loader, 2005). Payment certainty is another factor, with survey evidence showing this factor to be among the main perceived benefits of supplying public sector organisations (MacManus, 1991). Besides this, some types of public procurement provide innovative firms with the opportunity to commercialise new products and services (Georghiou *et al.*, 2014). Against these attractions, business-to-government (B2G) is bureaucratic, legalistic and arms-length when compared to business-to-business (B2B) (Lian and Laing, 2004). As such, it represents something of a double-edge sword for suppliers.

Internationally, the evidence indicates that firm size is strongly deterministic of involvement in public procurement. For instance, 74 per cent of the total value of procurement spend in the UK went to large firms as against 26 per cent for SMEs (House of Commons Library, 2015). In the EU Single Market large firms had a 71 per cent share of above-threshold contracts in 2014 while SMEs had a 29 per cent share (PwC, 2014). For large firms this is substantially above their gross value-added (GVA) in the EU economy and for SMEs substantially below their GVA. Arguably, one of the reasons for this imbalance is that larger firms have a greater

endowment of resources and capabilities for tendering. These resources and capabilities enable them to be more active and competitive in public procurement. To give theoretical weight and explanatory depth to this argument we turn to the RBV of the firm.

RBV theory

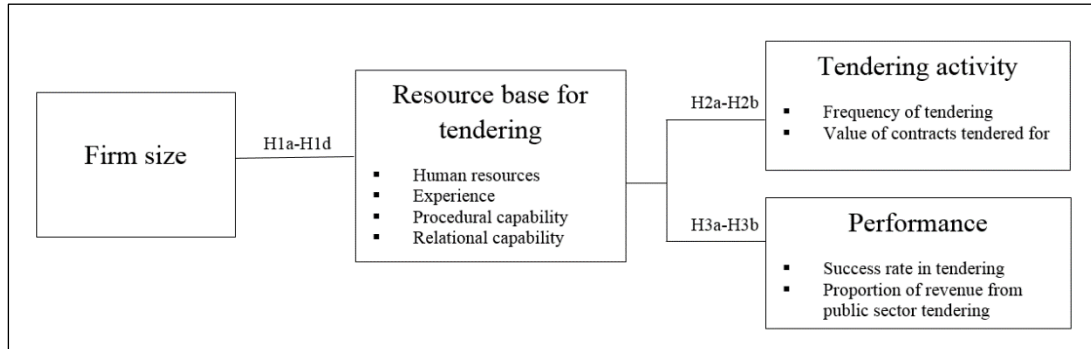
RBV as a theory explains performance in terms of bundles of resources owned or controlled by the firm. It views performance from the inside out and is synonymous with the work of Penrose (1959) and latterly Wernerfelt (1984) and Barney (1991). Its definition of resources is broad, encompassing all the assets, capabilities, organisational routines and informational attributes of the firm that enable it to compete (Barney, 1991, p. 101). There are two underpinning assumptions of RBV theory (Amit and Schoemaker, 1993; Barney, 1991; Makadok, 2001). The first is that the quantity and quality of resources owned or controlled by firms vary within and across industries. In other words, firms are heterogeneous as to their resource base. The second is that the various resource types, but particularly capabilities, are not always tradeable and can be organisation or context specific. Thus, the competitive advantage they yield for the firm becomes difficult for rivals to imitate. This can eventually give rise to a sustained competitive advantage.

What does RBV theory mean for firm involvement in public procurement? At the most fundamental level it means that firms likely possess varying bundles of resources and capabilities for tendering. These resource bundles have a significant bearing on their ability to compete efficiently and effectively in the public sector marketplace. A firm's complement of resources will, for example, affect decisions around how often to seek out and tender for contracts with public sector organisations, as well as the type and value of contracts to pursue. Reijonen *et al.* (2016) and Tammi *et al.* (2014) provide evidence of this in respect of entrepreneurial and market sensing resources, respectively. Moreover, resources and capabilities will directly impact the likelihood of succeeding in the public sector marketplace as regards contracts won and new revenue streams established – something which Flynn and Davis (2016a) demonstrated.

In the remainder of this section we describe our conceptual model (see Figure 1). It takes firm size as the point of departure in explaining involvement in public procurement. Firm size is understood to predict the resource base for tendering. Specifically, firm size is expected to predict (i) human resource availability for tendering (ii) experience in tendering (iii) procedural capabilities and (iv) relational capabilities. The resource base for tendering is then expected to influence tendering activity and performance. Indicators of tendering activity are frequency of

tendering and the typical value of contracts tendered for. Indicators of performance are success rate in tendering and proportion of corporate revenue that is derived from public sector tendering.

Figure 1. Conceptual model



Firm size and resource base

Findings from a number of studies indicate that firm size is deterministic of the tangible and intangible assets available for public sector tendering. Karjalainen and Kemppainen (2008), for instance, found micro enterprises to have less legal expertise and administrative capacity for tendering than small and medium enterprises. Flynn *et al.* (2015) discerned a similar pattern. In their investigation the size of the SME was positively linked to the organisational resources it had at its disposal for tendering as well as its willingness to avail of procurement-related training. Here we expect that firm size will be positively related to four resource types germane to public sector tendering. These are human resource availability for tendering, tendering experience, procedural capability and relational capability.

The relationship between firm size and human resource availability for tendering can be explained in terms of organisational slack. By organisational slack is meant the cushion of tangible and intangible resources that firms can draw on in response to internal pressures for adjustment or external pressures for change (Sharfman *et al.*, 1988). As well as human resources, slack can take the form of working capital, production capacity and inventory. Large firms have been shown by Sharfman *et al.* (1988) to operate with more slack than small firms. The reason being that they have greater financial and physical capacity to hold additional resources. In the context of public procurement, this means that larger firms are able to deploy more staff to respond to requests for tender (RFT) and to pursue business development opportunities with public sector organisations as they arise. Thus, we offer the following hypothesis.

H1a. There is a positive relationship between firm size and human resource availability for tendering.

Tendering experience is another valuable, albeit intangible, resource type for suppliers competing in the public sector marketplace. In this study we hypothesise that firm size is associated with tendering experience. The rationale for this predicted relationship is as follows. Organisations that are relatively large at birth or that grow quickly in their early years enjoy greater longevity than their smaller counterparts (Freeman *et al.*, 1983). By implication, larger organisations will have had more time to interact with public sector organisations and familiarise themselves with the idiosyncrasies of public sector tendering. In particular, they will have had longer to accumulate experience in searching, bidding for, negotiating and managing public sector contracts. Thus, we offer the following hypothesis.

H1b. There is a positive relationship between firm size and public sector tendering experience.

As with human resource availability and tendering experience, we expect firm size to predict tendering capabilities. We consider two types of capabilities connected to public procurement. The first, procedural capability, signifies being able to manage the formal, regulated aspects of tendering and contract administration (Flynn and Davis, 2016a). Larger firms are expected to possess superior procedural capability. This is the result of their formalised planning, management and operational control systems (Chenhall, 2003). Evidence of this, Huggins and Weir (2012) found the firm size correlates with the sophistication of internal systems, be it in relation to quality accreditation, sales, new product development or intellectual property management. As a result, larger firms are better equipped to cope with the procedural and technical rigours of public sector tendering. Smaller firms typically get by with less formalised management control systems and rely on what Matlay (2000, p. 207) termed “incidental knowledge” that is situation specific and never codified or communicated internally. Their ability to navigate the procedural aspects of tendering is limited because of it. Thus, we offer the following hypothesis.

H1c. There is a positive relationship between firm size and procedural capability for tendering.

The second capability type is relational in form. Relational capability is about firms engaging with public buyers and promoting themselves as value-adding supply partners (Flynn and Davis, 2016a; Moller and Torronen, 2003). Woldesenbet *et al.* (2012, p. 503) articulate it in terms of “a communication capability embracing the willingness and ability to make links, share experience and knowledge and foster trust and loyalty”. Firm size is also anticipated to

predict relational capability. The power and marketplace reputation of larger firms provides them with the means and the opportunity to seek out public buyers, build relationships with them and influence how they think about products and services. This is corroborated by findings that show larger firms possess more network capital and are skilled at leveraging it for value creation (Huggins and Weir, 2012). By contrast, smaller and younger firms find it challenging to establish communication channels with public buyers (Cabras, 2011), let alone exploit network capital for their commercial advantage (Woldesenbet *et al.*, 2012). Thus, we offer the following hypothesis.

H1d. There is a positive relationship between firm size and relational capability for tendering.

Resource base and tendering activity

As referred to previously, RBV theory posits that resources ultimately determine the ability of any firm to compete and succeed in its selected marketplace (Amit and Schoemaker, 1993; Makadok, 2001). In the words of Barney (1991, p. 101), resources are the basis on which a firm devises and implements its competitive strategy. This principle applies to the public sector marketplace the same as anywhere else. The set of resources and capabilities a firm has at its disposal will, in the first instance, condition its tendering activity. In this study, we examine two particular manifestations of tendering activity: frequency of tendering and typical value of contract tendered for. Frequency of tendering is a primary marker of activity in public procurement and has been used in several empirical studies (e.g. Reijonen *et al.*, 2016; Tammi *et al.*, 2014). The typical value of a contract tendered for can be seen as a proxy of ambition in the public sector marketplace.

The resource base of the firm is expected to affect frequency of tendering in manifold ways. Staff availability means that firms can regularly search and tender for contracts with public sector organisations. This may explain why, for example, UK firms with 50 or more employees were found to be more than twice as likely to access public tender documentation compared to firms with under 50 employees (Office for National Statistics, 2012). Limited human resource availability is going to constrain the regularity of tendering and may force some firms to engage in trade-offs between public and private sector opportunities. Accumulated experience in public procurement provides firms with the advantage of knowing when and where to search for contracts, be they publicly advertised or not. Supportive of this relationship, Pickernell *et al.* (2013) demonstrated that experience is a predictor of involvement in public procurement. Lack of experience in public procurement inhibits involvement. For example, public tendering

novices do not always know where to find out about opportunities relevant to their operations (Greer, 1999; Loader, 2005).

Capabilities should also influence frequency of tendering. Superior procedural capability implies that firms will have relatively few difficulties in understanding and responding to the technical and legal requirements set out in the RFT. Moreover, procedural capability implies tendering can be conducted in an efficient manner. The obverse is that deficiencies in procedural capability will stymie firms' ability and willingness to compete for public contracts. Recurring complaints by firms that the public procurement system is cumbersome and opaque (Fee *et al.*, 2002; Loader, 2005, 2015) allude to this very problem. Relational capability is also conducive to submitting tenders, albeit in a different way. Through the connections it fosters relational capability should lead to firms receiving invitations to tender (ITT) from buying organisations. Suggestive of this effect, Reijonen *et al.* (2016) have shown that firms with a proactive market orientation tender for public contracts more often. Taking these points together, we hypothesise the following.

H2a. There is a positive relationship between a firm's resource base and its frequency of tendering.

The resource base is also expected to predict the value of public contracts firms tender for. For one, tendering for higher value contracts entails a not insignificant amount of time, effort and resources. The average cost of putting together a bid in the EU is €3,200, with this figure rising in proportion to the complexity and value of the contract (Centre for Economic and Business Research, 2013). Therefore, firms need to have sufficient organisational capacity, both in respect of personnel and experience, when tendering for higher value contracts. Consistent with this argument, firm size has been shown by Flynn *et al.* (2015) to predict the value of contract pursued. This may be due to the fact that small firms' probability of winning falls sharply once the contract value exceeds €60,000 (PwC, 2014). In terms of capabilities, procedural capability allows firms to satisfy the oftentimes stringent qualification criteria used for higher value contracts and to demonstrate competence for managing the contract in the event of success. Complementary to this, relational capability instils confidence in firms to be ambitious. This confidence stems from the way in which relational capability begets credibility and traction with procurement decision makers (Woldesenbet *et al.*, 2012). Taking these points together, we hypothesise the following.

H2b. There is a positive relationship between a firm's resource base and the typical value of public contracts tendered for.

Resource base and performance

According to RBV theory, what resources a firm has at its disposal and how it utilises them determines competitive success (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). In line with this theoretical tenet, there is a growing body of evidence linking resources and capabilities to performance in public procurement. Karjalainen and Kempainen (2008) discerned a relationship between a firm's perception of its legal and administrative resources and the likelihood of it supplying the Finnish public sector. Firm size, whether measured in revenue or employee numbers, has also emerged as an antecedent of success in securing public contracts in the UK and the USA (Pickernell *et al.*, 2011; Temponi and Cui, 2008). Such findings should be seen in the context of research by Blackburn *et al.* (2013), which identifies age and size as the two principal determinants of SME performance. In reference to capabilities, we know that supply chain capabilities drive various measures of organisational performance, ranging from perceived customer value to financial results (Tracey *et al.*, 2005). We also know that tendering-specific capabilities are linked to performance in public procurement (Flynn and Davis, 2016a) and that adhering to RFT procedures is a prerequisite for being considered for public contracts (Withey, 2011). Taking these points together, we hypothesise the following.

H3a. There is a positive relationship between a firm's resource base and success in tendering for public contracts.

Apart from success rate, the resource base of the firm is anticipated to predict the proportion of a firm's total revenue that is derived from public sector tendering. Rationalising this predicted relationship, we make the following points. Having ample tendering resources and capabilities affords firms the option of maintaining a dual public-private marketplace presence. This should help to generate revenue from both public and private sector customers. Conversely, firms with few tendering resources and capabilities will struggle to gain a foothold in the public sector marketplace (Karjalainen and Kempainen, 2008; Pickernell *et al.*, 2011; Withey, 2011). Allied with the previous point, the risk averse culture and formalised processes that define public procurement are perceived to favour large, established suppliers (Walker and Preuss, 2008). This creates a dynamic in which larger firms gravitate towards opportunities in the public sector while smaller firms confine their efforts to the private sector. The fact that

large firms are universally over-represented in public procurement and small firms under-represented seems to bear this out (House of Commons Library, 2015, PwC, 2014). Thus, we hypothesise the following.

H3b. There is a positive relationship between a firm's resource base and the proportion of revenue that is derived from public sector tendering.

Research design

The research, hypothetico-deductive in form, is motivated by a desire to better understand the antecedents of firm participation and performance in public procurement. A conceptual model informed by RBV theory was specified initially. Variables for testing were identified based on foregoing studies. Each variable was operationalised and included in a survey instrument. The survey instrument was pre-tested with ten firms that had experience of tendering for public contracts, which is standard practice (Dillman, 2007). No issues were raised with regard to understanding the questions or pre-defined response sets. Ireland was chosen as the research setting. The Irish marketplace for public contracts, which accounts for approximately 12 per cent of national GDP, has undergone a series of policy changes since 2008 (OECD, 2013). All of these have sought to simplify the tendering process and make it accessible to smaller and younger firms. As such, Ireland represents an interesting context in which to test our model.

Operationalisation of variables

Firm size can be measured in a variety of ways, including through number of employees, the log of number of employees, annual turnover, assets, transactions and capacity (Gooding and Wagner III, 1985). The approach in this study is to use the unadjusted number of employees. Consistent with current EU policy on definitions of firm size as enunciated in Recommendation 2003/361/EC, the following four ranges are used: 1-9 employees (micro enterprise); 10-49 employees (small enterprise); 50-249 employees (medium enterprise); and 250+ employees (large enterprise). In respect of resources, human resource availability is operationalised as the number of employees ordinarily involved in preparing and submitting a tender on behalf of their firm. Tendering experience is operationalised as the total number of years that a firm has been involved in competing for public sector contracts.

Procedural and relational tendering capability constructs developed and validated by Flynn and Davis (2016a) are used in this study. Procedural capability has five items. These are (i) ability to satisfy tender qualification criteria (ii) ability to understand tender evaluation criteria (iii) ability to effectively respond to tender evaluation criteria (iv) ability to search contract award

notices and receive feedback on submitted bids and (v) ability to successfully manage an awarded contract. Relational capability has three items. These are (i) ability to influence buyer needs prior to tender (ii) ability to communicate value proposition to inform tender specification and (iii) ability to promote goods and services to the public sector prior to tender.

All items are measured on a 5-point Likert scale where 1 = very poor and 5 = excellent. Respondents had to assess their firm's ability on each item. Principal component factor analysis carried out using Varimax Rotation confirmed the presence of discrete procedural and relational capability constructs. The factor analysis results are robust, with all eight items loading at 0.70 or higher. Eigenvalues for each of the two constructs are above 2.0 and the Cronbach Alpha scores satisfy the 0.70 threshold. Further detail on the principal component analysis is presented in Table I.

<Insert Table I here>

Frequency of tendering is measured as the total number of public sector contracts that a firm tendered for throughout 2014. The typical value of a public contract tendered for is measured by reference to six ascending financial ranges. These are (1) 0- €25,000, (2) €25,001-130,000 (3) €130,001-250,000 (4) €250,001-500,000 (5) €500,001-1,000,000 and (6) €1,000,001+. Success rate in tendering is measured as the percentage of public sector contracts tendered for in 2014 that a firm secured. Proportion of revenue derived from public sector tendering is the percentage of 2014 revenue that comes from supplying public sector clients.

The survey process

Primary data to test the hypotheses was gathered by surveying firms. Contact details for the population were obtained from the registration database of e-Tenders, which is the official Irish government website for advertising public contracts. Firms have to register on e-Tenders in order to learn about and apply for current and future opportunities with the Irish public sector. When the research was carried out in January, 2015 there was an estimated 60,000 firms registered on e-Tenders. An email request to participate in the research, which contained an embedded hypertext link to the survey instrument, was sent to the registered representative of each firm. Following recommended practice, a reminder notification was issued seven days after the initial emailing (Dillman, 2007). The survey period lasted two weeks. Short cycle-times are characteristic of e-surveying, as the decision to participate or not is usually taken on receiving the email request (Yun and Trumbo, 2000).

Self-administered surveying

Self-administered surveying was the preferred approach for data collection. Principally, it permitted access to a large and geographically dispersed enterprise population quickly and with minimal outlay of resources. Self-administered surveying does come with caveats, particularly around common method variance (Chan, 2009). As a precaution against threats to the validity of the data, advice proffered by Podsakoff *et al.* (2003) was followed. Mainly, this involved only requesting information that respondents could reasonably be expected to know and willing to disclose, designing concise and easy to interpret scale items, limiting the total number of scale items to eight and ensuring that respondents could participate without having to identify themselves or their firm.

Response rate

By the end of the two-week survey period 4743 responses had been received. This represents a response rate of 8 per cent from the 60,000 firms that had received a request to participate. The data screening process identified 343 duplicate cases. This was done by examining the IP address of each response. Duplicate cases refer to second and subsequent responses from the same firm. As only one response per firm was eligible, duplicate cases were eliminated. Thereafter, the screening process identified 1028 substantially incomplete responses. By substantially incomplete is meant responses that did not progress beyond the first section of the questionnaire, which was concerned with firm characteristics. Their elimination left the final number of usable responses at 3372.

Representativeness

To test for representativeness the characteristics of early and late respondents were compared. The early group consisted of the first 150 firms to respond. Their responses were received approximately three hours after the survey was distributed. The late group consisted of the last 150 firms to respond. Their responses were received over 10 days after initial contact, and then only after a reminder notification had been issued. If early and late respondents are not statistically different across most or all of their characteristics, then the respondent group is assumed to be representative of the population (Armstrong and Overton, 1977). The results of the independent sample t-tests show that early and late respondents are not significantly different in respect of age ($p = 0.50$), tendering experience ($p = 0.20$), frequency of tendering ($p = 0.47$) or success rate in tendering ($p = 0.59$). There is a statistically significant difference on size ($p < .01$), with late respondent firms somewhat larger than early respondents. This notwithstanding, respondents appear to be broadly representative of the public sector marketplace.

Respondent firm profile

Micro enterprises comprise 54.7 per cent of respondent firms, small enterprises 25.6 per cent, medium enterprises 12.2 per cent and large enterprises 7.5 per cent. These figures are consistent with what has already been established on the size composition of firms competing in the Irish public sector marketplace (National Procurement Service, 2012). They are also a reminder that the public sector marketplace has fewer smaller firms and a disproportionate number of larger firms relative to the enterprise population¹. Reported annual revenues reveal that 64.9 per cent earn less than €2 million, 19.3 per cent earn between €2-10 million and the remaining 16 per cent earn in excess of €10 million. Approximately 36.8 per cent have been trading for 10 years or less as against 63.2 per cent that have been trading for more than 10 years. Just over half of respondent firms (52.2 per cent) place themselves in the services sector, 17.7 per cent in the construction sector, 11 per cent in the manufacturing sector, and the remaining 19.2 per cent are dispersed across other sectors. In terms of jurisdiction, 71.6 per cent are domiciled in Ireland and 18.4 per cent in the UK and Northern Ireland. That leaves 10 per cent of firms based outside of these jurisdictions. Finally, 75.3 per cent of firms compete at either local, regional or national level versus 24.7 per cent that are internationally oriented. Further detail on the profile of respondent firms is contained in Table II.

<Insert Table II here>

Tendering characteristics

Starting with tendering resources, the average number of staff typically involved in preparing and submitting bids is 2.79. Average tendering experience among firms is 12.92 years. Firms score themselves 3.70 out of 5 on procedural capability and 2.94 out of 5 on relational capability. The mean number of tenders submitted by firms throughout 2014 is 9.62. The typical contract value that firms tender for is in the €25,001-130,000 range, as indicated by the mean score of 2.51 on the 1-6 scale. Success rate in tendering averages 26.12 per cent and the proportion of revenue derived from public sector tendering averages 23.73 per cent. Inter-correlations between these variables are presented in Table III.

1. Micro-enterprises make up 90.7 per cent of the Irish enterprise population, small enterprises 7.7 per cent, medium enterprises 1.3 per cent and large enterprises 0.3 per cent, according to government statistics.

<Insert Table III here>

Results

Results for the hypotheses are described in this section. One-way analysis of variance (ANOVA) is used to test relationships between firm size and the resource and capability base for tendering (see Table IV). The effect of firm size on each variable (F-ratio) is reproduced, as are the differences in mean scores between micro, small, medium and large enterprises. For exploratory purposes the direct relationship between firm size and tendering activity and performance is also examined. The effect of the resource base of the firm on tendering activity and performance is then tested using linear regression models (see Table V).

H1a states that there is a positive relationship between firm size and human resource availability for tendering. The effect of size on human resource availability is statistically significant ($F(3, 3305) = 501.89, p < .001, \text{partial } \eta^2 = .31$). Human resource availability for tendering increases with firm size, which results in the acceptance of H1a. Differences between all four size groups are significant at $p < .01$. While micro-enterprises have, on average, 1.77 persons available to tender, this figure rises to 3.04 for small enterprises, 4.39 for medium enterprises and 6.89 for large enterprises. H1b states that there is a positive relationship between firm size and tendering experience. The effect of size on tendering experience is also statistically significant ($F(3, 3348) = 230.63, p < .001, \text{partial } \eta^2 = .17$). Keeping with predictions, the larger the firm the greater its level of tendering experience. This leads to acceptance of H1b. The four size groups are significantly different at $p < .01$. Tendering experience ranges from 8.55 years for micro enterprises to 28.58 years for large enterprises.

H1c states that there is a positive relationship between firm size and procedural capability. The effect of size on procedural capability is statistically significant ($F(3, 3048) = 83.36, p < .001, \text{partial } \eta^2 = .07$). Procedural capability increases with firm size, thus allowing acceptance of H1c. Differences between size groups are significant at $p < .01$, although not in the case of medium and large enterprises ($p = .82$). The mean procedural capability scores for medium enterprises is marginally higher than large firms: 4.09 versus 4.07. H1d states that there is a positive relationship between firm size and relational capability. The effect of size on relational capability is statistically significant ($F(3, 3125) = 29.30, p < .001, \text{partial } \eta^2 = .02$). As relational capability is found to increase with size, going from 2.80 for micro firms to 3.36 for large firms, H1d is accepted. All size groups are significantly different at $p < .05$.

While not specified in the conceptual model, it is nonetheless useful to investigate how firm size relates to tendering activity and performance (see Table IV). The results are as follows. Firm size is associated with frequency of tendering ($F(3, 3245) = 174.64, p < .001, \text{partial } \eta^2 = .13$) and the typical value of the contract tendered for ($F(3, 3278) = 317.72, p < .001, \text{partial } \eta^2 = .22$). The relationship is linear in each case: as firms increase in size they tender more often and for higher value contracts. Likewise, firm size is significant in respect of success in tendering ($F(3, 3138) = 25.53, p < .001, \text{partial } \eta^2 = .02$). Notably, the mean difference between medium and large enterprises is not statistically significant ($p = .76$) and they report similar success rates. Lastly, firm size is statistically significant for proportion of revenue derived from public contracting ($F(3, 3161) = 8.75, p < .001, \text{partial } \eta^2 = .01$). Unlike success rate in tendering, the relationship is not linear. The proportion of revenue derived from public sector tendering peaks with medium enterprises 30.13 per cent. Small enterprises (24.54 per cent) and large enterprises (25.47 per cent) are almost equidistant from this peak.

<Insert Table IV here>

The second part of the results focus on the hypothesised relationships between resource base and tendering activity and performance. H2a predicts that the resource base of the firm is associated with frequency of tendering. The model is significant at $p < .01$ and explains 19 per cent of the variance. This leads to acceptance of H2a. All four predictor variables are statistically significant. In the case of relational capability the relationship is negative, indicating that firms with greater relational capability tender less frequently. Conceivably, firms with greater relational capability are discerning in what they tender for and only target opportunities which they have already discussed with public buyers. The standardised coefficient (Beta) scores show that human resource availability and experience matter more for frequency of tendering than either procedural or relational capability.

H2b predicts that the resource base of the firm is associated with the typical value of contract tendered for. This model is also significant at $p < .01$ and accounts for 20 per cent of the variance. H2b is accepted. Human resources, experience and procedural capability are significant and positive in respect of value of contract tendered for. Relational capability is non-significant. As with frequency of tendering, it is human resources and experience rather than capabilities that primarily influence the value of contracts firms pursue.

H3a states that there is a positive relationship between the resource base and success in tendering. This model is significant at $p < .01$ and explains 9 per cent of the variance. This lends

support to H3a. All four resource and capability predictors are significant. It is procedural and relational capability rather than human resources and experience that yield the greater effect on success rate. The Beta scores for the former are .14 and .15 respectively. Finally, H3b states that there is a positive relationship between the resource base of the firm and proportion of revenue attributable to public sector tendering. This model is significant at $p < .01$ and accounts for 6 per cent of the variance. H3b is accepted. Experience and procedural capability are positive and significant predictors of the proportion of revenue, with procedural capability having the slightly larger effect of the two. Human resources and relational capability are non-significant.

<Insert Table V here>

To summarise, the results show quite conclusively that firm size matters when explaining firms' ability to tender for public contracts. As firms increase in size they have more human resources, experience and procedural and relational capabilities for tendering. Stocks of resources and capabilities, in turn, affect tendering activity and performance outcomes. The pattern is one in which resources enable firms to tender more often and for higher value contracts whereas capabilities prove decisive in winning contracts tendered for. The influence of size on tendering resources and capabilities is not as simple as disadvantaged SMEs versus advantaged large enterprises. Medium enterprises, which are the biggest in size of the SME family, possess the same level of procedural capability and perform comparably to large enterprises. The SME sub-groups of micro, small and medium enterprises are a heterogeneous family as regards their resource base and, thereafter, their tendering activity and performance. This underscores the relative rather than absolute nature of their disadvantage against large firms. The next section takes up each of these points in more detail.

Discussion

Firm size has always been at the core of debate on supplier involvement in public procurement. Early studies in this field were pre-occupied with the difficulties inherent in being a small supplier and sought to identify the internal and external barriers affecting them (e.g. Greer, 1999; Loader, 2005; MacManus, 1991). In the years since, the narrative of disadvantaged small firms versus dominant large firms has become pervasive in both research and policy. Yet as has been argued elsewhere, such binary distinctions are not exactly helpful when they imply that SMEs are uniformly disadvantaged in public procurement (Flynn *et al.*, 2015) or in any other marketplace for that matter (Pett *et al.*, 2012). To help in moving beyond this point our paper has taken a more fine-grained perspective on firm size and involvement in public

procurement. It anchors its ideas in RBV theory, which adds explanatory depth to this line of inquiry.

First, our results demonstrate that the bigger the firm the better resourced it is to tender for public contracts, which is consistent with foregoing research into tendering resources specifically (Flynn *et al.*, 2015; Karjalainen and Kemppainen, 2008; Temponi and Cui, 2008) and organisational capital generally (Huggins and Weir, 2012). As well as being endowed with greater tendering resources, we show that larger firms are more adept at leveraging their resources in pursuit of public sector contracts. In other words, their tendering-specific capabilities are superior. It is interesting to note that all firm sizes rank themselves lower on relational capability than procedural capability. No doubt this is a consequence of the arms-length nature of public sector tendering (Lian and Liang, 2004) and the inevitable obstacles this poses for firms in nurturing relationships with public buyers and persuading them as to the merits of their products and services (Cabras, 2011; Woldesenbet *et al.*, 2012). RBV theory assumes that the quantity and quality of resources varies across the enterprise population. We show that this assumption is true not only for SMEs versus large enterprises but also for micro versus small versus medium enterprises.

Thereafter, our results demonstrate that the superior complement of resources and capabilities of larger firms have a salutary effect on tendering activity and performance. This is consistent with RBV theory and its explanation of firm performance. As RBV contends, heterogeneity of firm assets accounts for what strategies firms implement and if these strategies deliver a competitive advantage (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). In the context of public procurement, we find that resources and capabilities yield different effects. Resources appear to enable firms to tender more frequently and for higher value contracts, which is similar to what Karjalainen and Kemppainen (2008) found on the relationship between resources and likelihood of supplying the public sector. Tendering capabilities, on the other hand, are more deterministic of success in tendering. This reinforces what has already been reported in the literature on the link between capabilities and performance (Flynn and Davis, 2016a; Tracey *et al.*, 2005; Withey, 2011).

As asserted at the outset, there has been a tendency to assume that SMEs are homogeneous as regards their attributes, behaviours, and even experienced outcomes in public procurement (Flynn *et al.*, 2015). The reality, as illustrated here, is that there are pronounced resource and capability gaps between the SME sub-groups, but especially between micro and medium

enterprises. By way of illustration, medium enterprises have twice the number of personnel for tendering compared to micro enterprises and over twice the amount of public procurement experience. These resource and capability gaps help explain why, for example, micro enterprises tender for 4.8 contracts per year, small enterprises 11.41 and medium enterprises 19.66 and why win rates range from 22 per cent for micro enterprises to 34 per cent for medium enterprises. In some respects medium enterprises are closer to large enterprises than the other two size groups with whom they share the SME designation. Proof of this, they report marginally higher levels of procedural capability, enjoy comparable success rates, and generate more revenue from public contracting than large enterprises. In this sense, SME disadvantage in public procurement is less black and white than shades of grey.

Implications for practice

In addition to its scholarly contribution, our research has implications for practice. First, current “one-size-fits-all” SME-friendly government policy requires re-assessment. Considering that micro, small and medium enterprises vary in their tendering resources and capabilities, the level of support they require and the type of actions that stand to benefit them are also likely to vary. In recognition of this, bespoke interventions for the group most in need of assistance, micro enterprises, may be justified, particularly as they number nine out of ten SMEs in the EU. Something similar has already been mooted by Loader and Norton (2015) in their recommendation that generic SME-friendly policy should be accompanied by sector-specific initiatives and that public buyers be granted discretion over how they implement it. As for medium enterprises, given the commonalities that exist between them and large enterprises it is questionable as to whether they need or deserve support. Going forward, it may be appropriate for policy makers and legislators to think in terms of micro and small enterprises (MSEs) rather than SMEs when it comes to widening access to public procurement.

Second, and following on from the previous point, public buyers are encouraged to ensure that contract competitions are not only SME-friendly but also micro and small enterprise-friendly (Flynn and Davis, 2016b). *Inter alia*, this means minimising the opportunity cost of tendering in view of the comparatively fewer staff and experience that these two SME sub-groups have available to them. Third, managers of micro and small enterprises are advised to enhance their tendering capabilities as they lag medium and large enterprises. Various strategies can be considered here. These include: recruiting individuals who can bring with them bridging and networking capabilities (Woldesenbet *et al.*, 2012); collaborating with external partners known to possess specific capabilities lacking in the focal firm (Whittaker *et al.*, 2016); and making

learning processes “intentional” so that knowledge is retained and capabilities developed within the organisation (Matlay, 2000, p. 208).

Limitations and future research

There are limitations to our study, which we acknowledge. The treatment of resources and capabilities is not exhaustive. Future research may wish to take account of additional resources e.g. use of external consultants, IT infrastructure and other capabilities e.g. production, delivery, process innovation (Moller and Torronen, 2003). It may also be useful to examine not only tendering activity but also the regularity with which firms search for available contracts, as Reijonen *et al.* (2016) did. Furthermore, performance could be examined at different levels of the public sector e.g. central government versus local government. Another limitation concerns our reliance on firm size as the sole discriminating factor. While firm size is a primary determinant of productivity and performance (Blackburn *et al.*, 2013; Gooding and Wagner III, 1985), other factors such as owner-manager traits, growth intentions and geographic location are also deserving of empirical scrutiny (Pickernell *et al.*, 2011). Finally, the results are based on survey data obtained from firms competing for public contracts in Ireland. Replicating this research design, or similar, in another institutional setting would allow cross-national comparisons to be made.

Conclusion

Promoting SME involvement in public sector supply chains has become a mainstay of government policy internationally and a topic round which much procurement research has coalesced (Flynn and Davis, 2016b; Kidalov and Snider, 2011). Still, there remains a paucity of empirical evidence and theorising on the precise relationship between firm size and ability and willingness to tender for public contracts. Our study offers a more penetrating analysis of this relationship by comparing the resources and capabilities of micro, small, medium and large enterprises and how these, in turn, affect tendering activity and performance. It does so through the lens of RBV of the firm, which brings some theoretical grounding to the problem. Its findings point to the desirability of moving beyond SME versus large firm distinctions and instead embracing a more layered, nuanced understanding of firm size and its effects. This has direct implications for how firm involvement in public procurement is investigated as well as how public policy is formulated and implemented. There is a need for more research in this area. With this in mind, a number of actionable recommendations to steer future inquiry are set forth.

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Table I. Principal component analysis

	Cronbach Alpha	Eigenvalue	% variance explained	Factor loading	Communal ities	Mean score
Procedural capability ^a	.85	3.18	63.64%			
Ability to satisfy tender qualification criteria				.80	.64	3.75
Ability to understand tender evaluation criteria				.84	.71	3.60
Ability to effectively respond to tender evaluation criteria				.89	.80	3.70
Ability to search contract award notices and receive feedback on submitted bids				.70	.49	3.18
Ability to successfully manage an awarded contract				.72	.52	4.28
Relational capability ^b	.87	2.40	80.05%			
Ability to influence buyer needs prior to tender				.90	.82	2.71
Ability to communicate value proposition to inform tender specification				.88	.78	3.16
Ability to promote goods and services to public sector prior to tender				.89	.79	2.95

^a KMO Measure of Sampling Adequacy = 0.84. Bartlett's Test of Sphericity $p < .001$ ($\chi = 6988.22$).

^b KMO Measure of Sampling Adequacy = 0.74. Bartlett's Test of Sphericity $p < .001$ ($\chi = 4859.57$).

Table II. Respondent firm characteristics

Firm size	%	Sector	%
Micro	54.7	Manufacturing	11
Small	25.6	Services (Professional & Retail)	52.2
Medium	12.2	Construction	17.7
Large	7.5	All other	19.1
Annual turnover €	%	Jurisdiction	%
< 2 million	64.9	Ireland	71.6
2-10 million	19.3	UK & Northern Ireland	18.4
10-50 million	9.6	Rest of Europe	5.9
50+ million	6.3	Rest of World	4.1
Age	%	Market focus	
0-5 years	20.6	Local	13.6
6-10 years	16.2	Regional	15.6
11-20 years	25.8	National	46.2
21+ years	37.4	International	24.3

Table III. Correlations

	Firm size	Human resources for tendering	Experience in tendering	Procedural capability	Relational capability	Frequency of tendering	Contract value	Success rate in tendering	Revenue from public sector
Firm size	1								
Human resources for tendering	.55**	1							
Experience in tendering	.41**	.37**	1						
Procedural capability	.26**	.22**	.20**	1					
Relational capability	.16**	.18**	.13**	.53**	1				
Frequency of tendering	.37**	.31**	.39**	.18**	.06**	1			
Contract value	.39**	.39**	.30**	.22**	.13**	.23**	1		
Success rate in tendering	.15**	.13**	.15**	.25**	.25**	.11**	.08**	1	
Revenue from public sector	.07**	.11**	.18**	.21**	.14**	.30**	.18**	.42**	1

**p <.01

Table IV. ANOVA results of group differences

	Micro (1-9 employees) n = 1835	Small (10-49 employees) n = 857	Medium (50-249 employees) n = 408	Large (250+ employees) n = 252	Population average
Tendering Resources					
Human resources for tendering	1.77 ^a	3.04 ^a	4.39 ^a	6.89 ^a	2.79
Experience in tendering	8.55 ^a	14.18 ^a	20.35 ^a	28.58 ^a	12.92
Tendering Capabilities					
Procedural capability	3.51 ^b	3.84 ^c	4.09 ^d	4.07 ^d	3.70
Relational capability	2.80 ^a	3.02 ^a	3.17 ^a	3.36 ^a	2.94
Tendering Activity					
Frequency of tendering	4.80 ^a	11.41 ^a	19.66 ^a	24.32 ^a	9.62
Contract value	1.96 ^a	2.72 ^a	3.56 ^a	4.09 ^a	2.51
Performance					
Success rate in tendering	22.11% ^b	28.59% ^c	34.34% ^d	35.16% ^d	26.12%
Revenue from public sector	21.77% ^e	24.54% ^e	30.13% ^e	25.47% ^e	23.73%

^a All groups statistically different.

^b Micro enterprises statistically different from all other groups.

^c Small enterprises statistically different from all other groups.

^d No statistical difference between medium and large enterprises.

^e All groups statistically different except small and large enterprises.

Table V. Predictive tests

	Frequency of tendering	Contract value	Success rate in tendering	Revenue from public sector
Human resources for tendering	.18** (.12)	.31** (.01)	.04* (.24)	.01 (.23)
Experience in tendering	.30** (.02)	.16** (.00)	.08** (.04)	.13** (.04)
Procedural capability	.12** (.41)	.12** (.03)	.14** (.81)	.16** (.77)
Relational capability	-.07** (.31)	-.01 (.02)	.15** (.63)	.03 (.60)
n	2952 ^a	2975 ^a	2877 ^a	2899 ^a
Constant	-3.30** (1.30)	9.19** (.11)	-4.52** (2.56)	-1.74** (2.46)
<i>F</i>	182.39	190.19	76.46	50.39
Adjusted R Square	.19	.20	.09	.06

The standard error is in parentheses.

^a Does not equal group total, 3372, due to missing values.

**p <.01 *p <.05.