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THE IMPACT OF SIZE ON SME PUBLIC SECTOR TENDERING

Small and medium-sized enterprise (SME) involvement in the marketplace for public sector contracts has been the subject of scholarly interest for some time. Studies undertaken to date have largely concentrated on SME resource disadvantage relative to large firms in competing for and winning public sector contracts. Much less attention has been paid to disadvantage within the SME population and how factors such as size, sector and owner characteristics affect SME tendering. In response, this paper examines the relationship between size and SME public sector tendering. Findings show that size as measured by number of employees significantly influences SMEs' tendering resources, behaviour, and success; micro-enterprises, in particular, are found to be resource disadvantaged, tender less often, and have lower success rates compared to small and medium-sized enterprises. These findings support the case for recognising SMEs as heterogeneous tenderers and point to the need for more focused research on how SME characteristics influence ability and willingness to tender. Questions are also raised over the efficacy of current 'one-size-fits-all' policy for facilitating SME access to public procurement.

Keywords: SMEs; public procurement; size; tendering; micro-enterprises

INTRODUCTION

Owing to their numerical dominance, dispersal across almost all industry sectors, and local market focus, small and medium-sized enterprises (SMEs) have a central role to play in meeting the supply needs of public sector organisations. Among the traits said to make SMEs particularly attractive as public sector suppliers include a strong entrepreneurial orientation, flexibility and customer responsiveness (Woldesenbet, Ram and Jones, 2012). SMEs, for their part, are shown to be interested in contracting with public sector organisations and perceive benefits in the form of certainty of payment, prompt payment, long-term opportunities for growth, and reputation enhancement (Bovis, 1996; Fee, Erridge and Hennigan, 2002; Loader, 2005). Mutually beneficial though it may be for SMEs and public sector organisations to interact, the reality of everyday procurement practice paints a different picture. Reports of SMEs' frustration with the resource demands public tendering systems make of them are common and long-standing (Loader, 2007; MacManus, 1991; Purchase, Goh and Dooley, 2009) and SMEs' participation and success rates in the public sector marketplace do not match their weighting in the economy (GHK, 2010). The latter report brings this performance gap into focus, identifying SMEs as winning 33 percent of the total value of contracts advertised on the Official Journal of the European Union (OJEU) between 2006 and 2008 as against their 99.8 percent presence in the population of EU enterprises.

The potential-performance gap that characterises SME involvement in public procurement has led to sustained investigation of the factors that inhibit SMEs in competing for and winning contracts with public sector organisations (Loader, 2013). It has also stimulated a series of political initiatives in Europe, the United States and elsewhere designed to strengthen SMEs' presence in the public sector marketplace (Arrowsmith, 1995; Bovis, 1998; Clarke and Moutray, 2004; Kidalov and Snider, 2011, 2013). Implied in much of scholarship is a public tendering system that deliberately or otherwise privileges large firms over SMEs. Evidence from across a range of jurisdictions describes how SMEs often struggle to deal with the procedural hurdles, administrative complexity, and the time and human resource demands that even low value public procurement competitions entail (Cabras, 2011; Flynn et al, 2013; Greer, 1999; McManus, 1991). The conclusion to be drawn from these and related studies is that the very character of public sector tendering – a mix of bureaucracy and legalism - militates against SMEs' chances of success. In comparison to the superior resources, brand recognition, and political power of large firms, SMEs are understood to operate at a competitive disadvantage. Commenting on the public procurement policy landscape in both the United States and Europe, Kidalov and Snider (2011) reason that the on-going rollout of 'SME-friendly' policies only serves to confirm how tendering remains hugely problematic for SMEs. More pointedly, by their very presence 'SME-friendly' policies are an admission of market failure.

Empirical focus on the challenges SMEs encounter when tendering for public sector contracts has yielded valuable insights. It has revealed how the economic 'rules of the game' differ between the public and private spheres of the economy and why SMEs often struggle to establish themselves in the public sector marketplace as a result. But it has also come with a downside. In highlighting SME disadvantage relative to large corporations, there has been a tendency to overlook diversity within the SME population and its implications in the context of public sector tendering. Excepting a limited number of studies (Karjalainen and Kempainen, 2008; McKeivitt and Davis, 2013; Pickernell et al, 2011), SMEs are typically understood and presented as a homogeneous population of enterprises possessing equal capabilities, sharing similar objectives, and facing challenges of equal magnitude. This issue has not gone unnoticed, as when Morrissey and Pittaway (2006:280) in their review of SME purchasing opine that '....all of the studies reviewed assume homogeneity, that the motives underpinning practices are the same, and that all SMEs can be grouped together'. Notably, the same authors predict that SME purchasing practices are likely to vary across industry sectors and between SME size groups. In spite of such observations, public procurement and supply chain research is replete with assumptions of SME homogeneity. Cambra-Fierro and Polo-Redondo (2008), for example, probe differences between SMEs and large firms in how they manage their supply chain relationships but do not countenance differences within the SME population. Along similar lines, Baden, Harwood and Woodward

(2011) assess the impact of buyer expectations over environmental and social responsibility standards on SMEs. They do so, however, absent of consideration that such expectations might differentially impact SMEs depending on their size or other organisational characteristics.

It is not only in academic research that a simplistic and generic impression of SMEs as tenderers obtains. Assumptions of SME homogeneity are equally prevalent in the formulation of public procurement policy. The European Commission's (2008) 'European Code of Best Practices Facilitating Access by SMEs to Public Procurement Contracts' is intended to make public sector tendering more conducive to SME participation. Its object of interest is the SME even though data on the award of contracts at EU level has consistently shown that the smallest SME subgroup, micro-enterprises, fare worse than small or medium-sized enterprises in the number and financial value of contracts won (GHK, 2007, 2010). 'SME-friendly' policies promulgated at EU member state level assume similar stances, making no distinction between SMEs size, age, sector, technology, and growth intentions. To give but two examples, policy in Britain speaks of 'accelerating the SME economic engine through transparent, simple and strategic procurement' (Glover, 2008) while in Ireland emphasis is placed on 'creating a level playing field' for SMEs to compete for public sector contracts (Department of Finance, 2010). Evidently, policy makers and elected representatives at both national and supranational level have yet to look beyond the SME in their efforts to re-balance public procurement in favour of smaller and newer enterprises.

Prevailing assumptions of SME homogeneity in public sector tendering begin to look increasingly untenable on closer inspection. As a targeted intervention 'SME-friendly' policy is unique in having near universal application to the enterprise population. In Europe, for example, 'SME-friendly' policy is applicable to over 99 percent of enterprises. Its breadth of coverage should give pause for thought, especially over its ability to appreciably impact the functioning of the public tendering system and the experience of small firms therein. Secondly, to assume SME homogeneity in the context of public procurement is to diminish the role played by organisational factors such as size, industry sector, market focus, and age profile. It is empirically established that the SME population is diverse, being comprised of firms of different characteristics, abilities and motivations (Hamilton, 2012; Mir and Feitelson, 2007; Smallbone, Leigh and North, 1995; Storey, 1994). Moreover, SMEs are owned and managed by people holding not always similar aspirations or goals, with archetypes ranging from the ambitious entrepreneur to the 'lifestyler' business owner (Fillis, 2004). In biological terminology the SME epithet approximates more to a genus than a species. Therefore, not to recognise and make allowance for SME diversity in public sector tendering runs contrary to extant theory and empirical evidence in the SME field.

The main argument of this paper is that research and policy at the SME-public procurement interface is remiss in treating SMEs as a singular, monolithic entity and rendering differences within the SME population all but moot. Pett, Wolff and Sie (2012:49) describe this as the 'insidious assumption of homogeneity', a consequence of defining SMEs against large enterprises and accentuating the disadvantage of the former when competing with the latter. Not that this simple dichotomy of SMEs versus large enterprises is unique to public procurement. As Torres and Julien (2005) have argued, thirty years of delineating small firms from their larger counterparts has led to the exaggeration of SME commonalities and the downplaying of SME heterogeneity in management research generally. Eschewing the SME versus large corporation dichotomy, a more nuanced interpretation of SMEs as public sector tenderers is aimed for here. In particular, this paper concentrates on the role that firm size plays in influencing SME tendering. Apart from size, organisational variables including sector, age, and ownership structure are potentially useful. However, parsing SMEs' behaviour and outcomes by size is among the most common, peer-accepted approaches and is highly practical for the purposes of survey-based research (Beck, Demircug-Kunt and Maksimovic, 2006; O'Regan and Ghobadian, 2004). Using size as the discriminating characteristic is also consistent with how the European Commission and the U.S. government define what legally constitutes an

SME.¹ In addition, recent findings from Blackburn, Hart and Wainwright (2013) concerning SME performance reveal size and age to be the two most significant variables. Manifestly, size matters when explicating SME behaviour and outcomes. Its inclusion for the purposes of unpicking SME involvement in public sector tendering is, therefore, appropriate and justifiable.

Drawing on data from over four thousand SMEs active in a national public procurement market, this paper examines if size influences SME tendering. Overall, size is shown to significantly influence SME tendering. The implications of the results are manifold. They suggest that issues surrounding resource disparities, propensity to bid, and success rates are just as salient within the SME population as they are between SMEs and large firms. Future research on SMEs and public sector tendering is advised to move beyond assumptions of SME homogeneity and grapple with the significant differences that exist between SME size categories. The findings also raise searching questions over the efficacy of ‘one-size-fits-all’ policies designed to augment SMEs’ ability to tender for public sector contracts. Specifically, what positive impact can ‘SME-friendly’ policy have on its intended targets if significant differences exist between micro, small and medium-sized SMEs in their tendering abilities and behaviours? The remainder of this paper is structured as follows. The next section summarises the trajectory of research on SMEs and public procurement to date. The relationship between size and SME tendering resources, behaviours, and outcomes is then examined and hypotheses are articulated. This is followed by a description of the research design, the data collection method, and survey respondent characteristics. The results are then presented and discussed. In the final section the implications of the findings for research and policy-practice are explored.

SMEs AND PUBLIC PROCUREMENT

As a research domain within the social sciences public procurement continues to grow as its research foci reflect contemporary policy and practice trends (Thai, 2001). Public procurement is situated within a multi-stakeholder environment (Erridge 2007, 2009) and is discussed, *inter alia*, in terms of social justice (McCrudden, 2007), sustainability (Preuss, 2007, 2009; Walker and Brammer, 2009; Walker and Preuss, 2008), labour standards (Howe and Landau, 2009) and market competition (Caldwell et al, 2005). The envisaged role for public procurement goes beyond securing goods and services in the most economical way to include concern for myriad socio-economic issues. This line of inquiry finds its fullest expression at the intersection of SMEs and public sector contracting. Leveraging procurement expenditure in the interests of SME growth and professionalization has been a feature of the economic policy landscape for some years, as evident in the European Commission’s (1990) ‘Promoting SME Participation in Public Procurement in the Community’. Behind the SME agenda in public procurement is an attempt to correct for a perceived bias towards large corporations (Anglund, 1999). Moreover, the SME-public procurement nexus is but one part of an overarching State support strategy for SMEs (Beaver and Prince, 2004) and has latterly come to be associated with ideas on ‘joined-up’ governance (Downe and Martin, 2006) in which public procurement policy and practice are aligned to enterprise goals (Preuss, 2011).

Not surprisingly, leveraging public procurement for the benefit of SMEs has taken on greater importance in the wake of the 2008 financial crisis and its adverse impact on SME growth and survival rates. To put the effects of the financial crisis into perspective, production output by the European population of SMEs declined by 5.5 percent in 2009 compared to 2008 and an estimated 3.25 million SME jobs were lost between 2009 and 2010 (EIM, 2010). This challenging economic climate prompted calls for more public sector contract opportunities to be made available to SMEs so as to arrest the fall in output and the haemorrhaging of jobs (Murray, 2009). It also provided the backdrop for renewed policy efforts to reduce, if not eliminate, the administrative and procedural barriers believed to inhibit SME participation in the marketplace for public sector contracts, most recently enunciated in the Single Market Act IP/11/469 (European Commission, 2011). These barriers include bureaucracy, lack of communication between SMEs and public procurers, and too much weighting on cost (Cabras, 2011), SMEs’ lack of knowledge over how to source opportunities or engage with the procedural aspects of tendering (Greer, 1999; Loader, 2005, 2007), onerous

tender documentation and unprofessional procurement staff (Fee, Erridge and Hennigan, 2002), the time demands of completing tender documentation, requirements for previous relevant experience, and the financial costs of tendering (Flynn et al, 2013) and large contract sizes and information asymmetries (Bovis, 1996). The evidence from across a range of jurisdictions suggests that the very nature of public sector tendering and SME resource limitations work in combination to stymie SME participation and reduce their chances of success.

As conveyed above, studies undertaken to date have paid particular attention to the barriers experienced by SMEs when competing for public sector contracts. In turn, this has shaped the trajectory of contemporary procurement policy, which is geared towards enabling SMEs to better compete for public sector contracts, but without going so far as to discriminate in their favour (Kidalov and Snider, 2011). Yet, beyond it being established that SMEs experience difficulties of a greater magnitude than large firms when tendering, little is known on SME participation in the public sector marketplace. Such is the emphasis on SME disadvantage that more fine-grained treatment of SMEs' status as tenderers is all but absent. In spite of occupying a central position in research and policy discourse on public procurement, SMEs' role as tenderers remains under-researched and poorly understood. Withey (2011), for example, notes that notwithstanding their prominent position, there is a dearth of empirical study on SMEs' attitudes toward public sector contracting. This is a serious omission in both the small business and public procurement academic domains. It is also one that motivates this paper to move beyond generalisations of SME disadvantage and test for variation in tendering behaviour within the SME population. Towards this end, the relationship between size and SME public sector tendering is explored and hypotheses are put forward for testing. These are subject to elaboration in the next section.

SIZE AND SME PUBLIC SECTOR TENDERING

Size and SME Tendering Resources

The relationship between firm size and SMEs' resources for public sector tendering warrants a greater degree of scrutiny than research has allowed for up to this point. Among the few studies that have disaggregated SME tendering by size, Karjalainen and Kemppainen (2008) found that possessing the requisite legal expertise and administrative capacity to tender successfully constituted more of a problem for micro-enterprises than their small or medium-sized counterparts. Tangential to these findings, research on SME tendering in the EU market for public sector contracts suggests that micro-enterprises are "more vulnerable to the overall administrative burden of the procedure and late payments" but that "there is barely any variance between the opinions of large and medium-sized, and only a little between large and small enterprises" (GHK, 2010:51). However, it has yet to be determined if size is a significant influencing factor on other relevant dimensions of SME tendering capacity, such as experience in negotiating the public contracts system or the number of employees ordinarily involved in submitting bids. Furthermore, the possibility that size is associated with SMEs' willingness to avail of training directly related to developing skills for success in public sector tendering remains untested. While SMEs are shown to be reluctant to take advantage of training opportunities (Marlow, 1998; Patton, Marlow and Hannon, 2000), it is unclear as to how this plays out between SMEs of different sizes and within a public procurement context. On the basis of the above, the following hypotheses are proposed for testing.

H1a: There is no difference in public sector tendering experience between micro, small and medium-sized SMEs.

H1b: There is no difference in the number of employees involved in public sector tendering between micro, small and medium-sized SMEs.

H1c: There is no difference in the propensity to avail of tender-related training between micro, small and medium-sized SMEs.

Size and SME Tendering Behaviour

As with size and SMEs' resources for tendering, the relationship between size and tendering behaviour is something of a 'black box'. Hence, questions remain outstanding on whether SMEs of different sizes exhibit similar patterns of tendering behaviour. Of relevance here is the annual number of public sector tenders submitted and the average value of contract sought. The results of previous investigations of size and SME behaviour are inconclusive. For example, O'Regan and Ghobadian's (2004) findings did not allow them to affirm size as a discriminating factor in SMEs' strategic planning processes, leadership, or organisational processes and Pett, Wolff and Sie (2012) were only able to return partial support for their contention that SMEs of different sizes exhibit different degrees of entrepreneurial orientation, learning orientation, and information technology competence. Receiving feedback on unsuccessful tenders constitutes another crucial dimension to SME tendering behaviour. SMEs' reported difficulties with obtaining feedback from public buyers are well documented and stem from a number of factors, including SME hesitancy in approaching public sector organisations, a lack of business nous, and poor awareness of feedback entitlement and public buyers' legal obligations in this regard (Flynn et al, 2013). While obtaining feedback appears to present more of a challenge for micro-enterprises than small or medium-sized enterprises (GHK, 2010), the impact of size on SMEs' likelihood of seeking feedback from public buyers has not been subject to empirical testing. Thus, the following hypotheses are proposed in respect of size and SME tendering behaviour.

H2a: There is no difference in the frequency of tendering between micro, small and medium-sized SMEs.

H2b: There is no difference in the financial value of contracts tendered for between micro, small and medium-sized SMEs.

H2c: There is no difference in the extent to which feedback is obtained on unsuccessful tenders between micro, small and medium-sized SMEs.

The adoption and utilisation of information and communications technology (ICT) is one area in which SME size is shown to play a significant role. Foregoing research has found that SMEs with less than 50 employees have lower rates of broadband adoption than SMEs with greater than 50 employees (Arbore and Ordanini, 2006) and experience greater constraints in enterprise resource planning (ERP) system adoption (Laukkanen, Sarpola and Hallikainen, 2007). Similar to the above, micro-enterprises are shown to make less use of the internet for managing their supply chains compared to either small or medium-sized firms (Levenburg, 2005). In addition, owner-managers of micro and small firms report less positive attitudes to the use of technology for communication than larger firms (Admiraal and Lockhorst, 2009) and are less competent in ICT usage (Pett, Wolff and Sie, 2012). Hence, size appears as a significant influencing factor for SMEs on ICT adoption and usage. As an extension to this line of inquiry, the relationship between size and the extent to which SMEs identify public sector contracts online is deserving of testing. This leads to the following hypothesis.

H2d: There is no difference in the extent to which public sector contracts are sourced online between micro, small and medium-sized SMEs.

Size and SME Tendering Success

The under-representation of SMEs in public procurement is widely acknowledged and attributed to a range of inter-connected issues and circumstances discussed previously. Available data on the distribution of contracts at European Union level shows that SME performance levels are inferior to larger corporations and micro-enterprise performance levels are lowest of all enterprises size types (GHK, 2007, 2010). While analysis of the distribution of high value contracts advertised on OJEU provides some insights into the role of size on SME success rates, no examination has been carried out on size as a factor in explaining SME performance variation in national public procurement markets. To address this knowledge deficit the relationship between size and proportion of revenue generated from winning public sector contracts and the relationship between size and perception of tendering success are put forward for hypothesis testing.

H3a: There is no difference in the percentage of revenue attributable to public sector contracts between micro, small and medium-sized SMEs.

H3b: There is no difference in perception of tendering success between micro, small and medium-sized SMEs.

DATA COLLECTION

Data on SME tendering activity was drawn from the Irish public sector marketplace. The data gathering process involved electronically surveying suppliers registered on Ireland's national public procurement portal. Each registered supplier received an email request to participate in the research as well as an embedded link to the survey. Adopting this approach ensured that the research population of interest was covered. A non-probability sample was used as it was not possible to generate a sample frame of SME suppliers competing in the public sector marketplace a priori. The exploratory nature of the research, involving testing the relationship between size and SME tendering, makes a non-probability or convenience sample acceptable (Henry, 1990). Previous to its distribution the survey instrument was piloted with 20 Irish SMEs active in public sector tendering. Their observations were noted and, where appropriate, alterations to the survey instrument were made to improve its accuracy and applicability to SME suppliers. Using a combination of rating scales and multiple choice questions the survey instrument was designed to capture information on SMEs' tendering resources, behaviours, and outcomes. Data on SME size, sector, age, geographic location, and market focus was also obtained. Consistent with best practice guidelines for survey-based research recommended by Dillman (1991, 2007), every effort was made to maximise the returns and minimise the costs to the survey population. This was done through attention to instrument design and layout, precise questioning, and clearly marked sections. Having a respondent-friendly survey instrument was deemed very important as response rates in supply chain research are shown to be in steady decline (Melnik et al, 2012).

Research Context

The Irish public procurement marketplace offers a suitable setting for investigating SME tendering activity. SMEs make up over 99% of the enterprise population in Ireland. More so again, micro-enterprises are numerically dominant, accounting for approximately nine out of ten of all firms (Small Business Forum, 2006). Economic trend data produced by the European Commission shows that this same SME population was buffeted by the 2008 international financial crisis (European Commission, 2011a). Between 2007 and 2010 SMEs' contribution to the Irish economy fell five percentage points from 53 percent to 48 percent, SME employment fell by 15 percent and final output plummeted by 18 percent. These adverse economic circumstances galvanised efforts to expand the number and range of public sector contracting opportunities available to SMEs. The award of public sector contracts came to be viewed as a direct means of palliating the effects of the recession on Irish-based SMEs. To promote greater SME participation in public procurement a series of reforms were enacted in 2010 by the Department of Finance. Their purpose is to lower the transaction costs incurred by SMEs when tendering for public sector contracts.² Notable among the reform measures is a reduction in the threshold for the open advertising of contracts from €50,000 to €25,000. Other measures involve the use of more proportional financial and insurance capacity criteria by public buyers, breaking contracts into lots where practical and financially feasible, and facilitating SME consortium bids. Collectively, these measures are designed to creating a 'level playing field' for SMEs to compete for public sector contracts. In sum, the Irish public procurement marketplace has and continues to undergo considerable change. The financial crisis of 2008 and its aftermath have meant that more and more SMEs are looking to the public sector marketplace for growth opportunities. At the same time a series of initiatives and policies have been enacted to make it easier for SMEs to identify, bid for and possibly win public sector contracts.

Respondent Characteristics

The data collection stage generated 5211 responses from the approximately 60,000 suppliers registered on Ireland's public procurement portal, giving a response rate of approximately nine percent.³ Out of the total number of survey respondents, 65 were eliminated in the first data screening phase as they did not declare their firm size. The second data screening phase involved the elimination of 579 large firms i.e. firms

with 250 or more employees. The tendering activity of large firms was not relevant for the purposes of this particular study. This left 4567 usable responses from SMEs known to be involved in public sector tendering. Table 1 gives a breakdown by SME size (measured by number of employees). Micro-enterprises make up 57 percent of respondents, small firms make up 28 percent, and medium-sized firms make up 15 percent. SME respondent characteristics other than size are as follows. SME respondent firms are predominantly domiciled in Ireland. Almost four out of five are Irish-based. In order of importance, the remainder is spread across Britain, Northern Ireland, Europe and all other continents. The legal status of SMEs shows that the limited company form is most common (Table 2). Seventy percent of SME respondents are limited companies and over 21 percent are sole traders. The average age of SME respondents is 20.3 years. Professional services, construction, information technology, engineering, and retail/distribution represent the five main industries of respondents. An examination of SME revenue distribution reveals that 69 percent report a turnover of less than €2 million, 20 percent are within the €2-10 million range, and the remaining 11 percent has a turnover of €10 million or more. Finally, 48 percent of respondent SMEs are focused on the national market, 34 percent on sub-national markets (regional or local), and 18 percent on international markets (Table 3).

Table 1 SME respondents by size

SME	Frequency (‘000)	Percent (%)	Cumulative Percent
1-9	2614	57.2	57.2
10-49	1270	27.8	85.0
50-249	683	15.0	100.0
Total	4567	100.0	

Table 2 SME respondents by legal formation

SME	Frequency	Percent (%)	Cumulative Percent
Sole trader	979	21.4	21.4
Partnership	236	5.2	26.8
Limited Company	3206	70.2	97
Unlimited Company	80	1.8	98.8
Registered Charity	47	1	99.8
Missing	19	.2	100.0
Total	4567	100.0	

Table 3 SME respondents by market focus

SME	Frequency	Percent (%)	Cumulative Percent
Local	674	14.8	14.8
Regional	828	18.1	32.9
National	2191	48.0	80.9
International	848	18.6	99.5
Missing	26	.5	100.0
Total	4567	100.0	

RESULTS

Listed in Table 4 are the key variables in this study. They are SME size, tendering resources, tendering behaviour, and tendering success. The measurement scale for each variable is also given. By no means exhaustive, these variables are nonetheless intended to capture the fundamentals of SME involvement in public sector tendering. SME size is measured by number of employees. Consistent with the most recent EU definition, the sub-categories of micro, small and medium-sized enterprises are employed. Micro-enterprises are defined as having between 1-9 employees,

small firms as having between 10-49 employees, and medium-sized firms as having between 50-249 employees. Tendering resources are operationalized in reference to three discrete variables, namely: experience of public sector tendering, number of employees ordinarily involved in tendering, and participation in tender-related training. Four measures are used for analysing tendering behaviour. These are the number of tenders for public sector contracts submitted throughout 2012, the typical value of contract tendered for, the percentage of tenders on which feedback was obtained in 2012, and the percentage of tenders sourced through an online central public procurement portal. Finally, tendering success is examined in respect of the percentage of 2012 revenue attributable to public sector contracts and perception of tendering success.

Table 4: List of variables and their operationalization

Variable	Measure	Scale
SME size	Number of employees	Micro (1-9) Small (10-49) Medium (0-249)
Tendering resources	Number of years of public tendering experience	1-unlimited years
	Number of employees involved in tendering	1 person Team Organisation-wide
	Participation in tender-related training in 2012	Yes/No
Tendering behaviour	Number of contracts tendered for in 2012	0-unlimited quantity
	Typical value of contracts tendered for	<€130,000/>€130,000 ⁴
	Percentage of tenders on which feedback was obtained	0-100%
	Percentage of contracts sourced online	0-100%
Tendering success	Percentage of 2012 revenue attributable to public sector contracts	0-100%
	Perception of success	Likert scale (1 very unsuccessful -7 very successful)

The results of the data analysis are detailed in the sections below. Post hoc statistical testing is carried out as relationships concerning the effect of size on SME tendering are not specified save for the null hypothesis. In the case of H1a, H2a, H2c, H2d, H3a and H3b one-way analysis of variance (ANOVA) is used to establish if there is any significance of variance of means in tendering resources, behaviours, and outcomes across micro, small and medium-sized SMEs. Table 5 provides a summary of ANOVA results, giving the mean values of each SME size category as well as the F-ratio, which represents the ratio of systematic variation to unsystematic variation. H1b, H1c and H2b involve categorical variables and so Pearson's Chi-square test is used to test for independence of means across these same SME size categories. Table 6 reports on the critical values and relevant t-statistics.

Size and SME Tendering Resources

Statistically significant differences are found to exist in tendering resources across SME size. Specifically, mean differences exist in tendering experience (H1a), number of employees involved in tendering (H1b), and propensity to avail of tender-related training (H1c). The null

hypothesis of no statistically significant difference across SME size is rejected in each case. In respect of H1a on public sector tendering experience, statistically significant differences are found between micro and small enterprises ($p < .05$), micro and medium-sized enterprises ($p < .05$), and small and medium-sized enterprises ($p < .05$). The mean difference is 5.70 years between micro and small enterprises, 11.41 years between micro and medium-sized enterprises, and 5.71 years between small and medium-sized enterprises. The F-ratio for the effect of size on tendering experience is 195, $p < .05$. H1b tests if the number of employees involved in tendering is independent of SME size. Analysis shows that the number of employees involved in tendering is dependent on SME size ($p < .05$). To test the strength of this association, the contingency coefficient and Cramer's V statistic are calculated. The results are .30 and .39 respectively ($p < .05$). These indicate a moderate association between SME size and number of employees involved in tendering. The third of the hypotheses relating to size and SME tendering resources focuses on propensity to avail of tender-related training. SME size and this variable are also shown to be dependent ($p < .05$). The strength of this dependency is quite low, however, with the contingency coefficient and Cramer's V both only .18 ($p < .05$).

Size and SME Tendering Behaviour

Hypotheses 2a, 2b, 2c and 2d examine the relationship between size and SME tendering behaviour. The first of these four hypotheses examines the relationship between size and SMEs' frequency of tendering. Statistically significant differences exist in tendering frequency between micro and small enterprises ($p < .05$), micro and medium-sized enterprises ($p < .05$), and small and medium-sized enterprises ($p < .05$). The mean difference is 6.39 between micro and small enterprises, 14.55 between micro and medium-sized enterprises, and 8.15 between small and medium-sized enterprises. The F-ratio in this case is 203 ($p < .05$). H2b tests if the typical value of contract SMEs tender for (low value $< €130,000$ or high value $> €130,000$) is independent of their size. Again, the null hypothesis is rejected as contract value and SME size are related ($p < .05$). The strength of association is moderate, as indicated by a Cramer V of .32 ($p < .05$). The relationship between SME size and feedback obtained is tested in H2c. Here also size is also shown to have a significant influence on the extent to which SMEs obtain either written or oral feedback from public buyers, F-ratio 68 ($p < .05$). The mean difference between micro and small enterprises is 13.28 ($p < .05$). The mean difference between micro and medium-sized enterprises is 19.99 ($p < .05$). The mean difference reduces to 6.71 in the case of small and medium-sized enterprises but is still statistically significant at $p < .05$. Finally, H2d investigates whether the percentage of contracts SMEs sourced online through Ireland's procurement portal in the three years preceding the survey is independent of their size. On this dimension size is statistically significant between micro and small enterprises ($p < .05$) and micro and medium-sized enterprises ($p < .05$). In contrast, no statistically significant difference is observable between small and medium-sized enterprises in the extent to which public sector contracts are sourced online ($p > .05$), F-ratio 4.9 ($p < .05$).

Size and SME Tendering Success

Two measures of size and SME tendering success are tested. In both cases it is found that size has a significant influence on SME tendering success. The first hypothesis, H3a, examines size and SMEs' percentage of 2012 revenue attributable to public sector contracts. Size is shown to significantly influence SMEs' percentage of revenue attributable to public sector contracts, F-ratio 17.2 ($p < .05$). Mean differences between micro and small enterprises and micro and medium-sized enterprises are 4.1 and 7.8 respectively. These are statistically significant at $p < .05$. In contrast, the mean difference between small and medium-sized enterprises falls just outside the .05 level of significance ($p > .05$). The final hypothesis, H3b, tests perceptions of tendering success across the three SME size categories. A Likert scale of 1-7 is used to capture perceptions of success, where 1 is very unsuccessful and 7 is very successful. Statistically significant differences are observable between all SME size

categories, F-ratio 51.7 ($p < .05$). The mean difference between micro and small enterprises is .54 and between micro and medium-sized enterprises .85. The corresponding difference between small and medium-sized enterprises is .30.

Discussion of Results

Using data from 4567 SMEs competing for contacts with Irish public sector organisations a number of relationships concerning size and SME tendering were examined. Results of the statistical testing show that size significantly influences the tendering resources, behaviour and success of SMEs. Firstly, the analysis reveals that micro, small and medium-sized enterprises are not similarly endowed with resources for tendering. This is evident in tendering experience, number of persons involved in tendering, and propensity to avail of tender-related training. On each of these three dimensions size is shown to significantly influence SMEs' capacity for tendering. Micro-enterprises are found to be least experienced in public sector tendering (8.5 years on average) and medium-sized enterprises most experienced (20 years on average). The latter group have, on average, 11.4 years more tendering experience than micro-enterprises and 5.7 years more tendering experience than small firms. The number of employees involved in tendering also shows strong variation within the SME population. Whereas 73% of micro-enterprises rely on one person to manage the tendering process, this percentage drops to 39% in the case of small firms and 22% in the case of medium-sized enterprises. Viewed from a different angle, a minority of micro-enterprises use team-based approaches when tendering but a majority of small and medium-sized enterprises use teams. Participation in training is also found to be dependent on SME size. While the uptake of tender-related training among SMEs is low, almost one of every three medium-sized enterprises availed of such training in 2012 but this figure reduces to 19 percent for small firms and 12 percent for micro-enterprises.

Secondly, SMEs do not behave as one in tendering for public sector contracts. Size is found to significantly influence SMEs' frequency of tendering, value of contracts tendered for, extent to which feedback is obtained, and percentage of contracts sourced online. The frequency with which SMEs tender varies markedly depending on their size. To illustrate, micro-enterprises tendered for, on average, 5 public sector contracts throughout 2012 compared to 11 for small firms and 19 for medium-sized enterprises. As well as on the dimension of tendering frequency, size also influences the value of public sector contracts which SMEs aim to win. While 84% of micro-enterprises typically compete for contracts under €130,000, this reduces to 64 percent for small firms. Conversely, a majority of medium-sized enterprises, 55 percent, typically compete for contracts in excess of €130,000. Size is also shown to be influential in how SMEs behave after the award of a public sector contract. Based on 2012 tendering activity, 28 percent of micro-enterprises secured feedback on submitted tenders. The comparable figures for small and medium-sized enterprises are 41 percent and 48 percent respectively. The fourth and final dimension on which size and SME tendering behaviour is analysed is contract sourcing. Consistent with the emerging pattern, micro-enterprises source less public sector contract opportunities online (58 percent) compared to small enterprises (62 percent) and medium-sized enterprises (63 percent). It is of note that no statistically significant difference is observed between small and medium-sized enterprises in the extent to which they source contracts online.

Table 5 Size and SME tendering resources, behaviour, and outcomes (ANOVA mean testing)

Variable	SME size	Mean	St.dev	Between/within group means	F-Ratio	Sig
No. of years tendering experience (H1a)	Micro	8.56	9.37	27743/142	195	.000
	Small	14.26	13.13			
	Medium	19.97	17.92			
No. of contracts tendered for in 2012 (H2a)	Micro	5.09	7.49	40815/200	203	.000
	Small	11.48	16.09			
	Medium	19.64	27.32			
Feedback obtained on tenders submitted in 2012 (%) (2c)	Micro	27.89	37.45	98421/1439	68	.000
	Small	41.18	38.92			
	Medium	47.89	38.00			
% of contracts identified from central public procurement portal (H2d)	Micro	57.65	41.28	7868/1610	4.9	.000
	Small	61.92	38.66			
	Medium	63.01	37.86			
Public sector contracts as % of total revenue (H3a)	Micro	16.35	26.68	12408/720	17.2	.000
	Small	20.50	26.30			
	Medium	24.16	28.62			

Perception of success in public sector tendering (H3b)	Micro	2.71	1.91	175/3.4	51.7	.000
	Small	3.26	1.75			
	Medium	3.56	1.69			

Table 6 Size and SME tendering resources and behaviour (Independent t-testing)

Variable	Pearson’s value	Likelihood Ratio	Asymp. Sig.	Cramer’s V	Contingency coefficient	Approx. Sig.
Size and management of the tendering process (individual-team-all employees)	575	589	.000	.30	.39	.000
Size and propensity to avail of tender-related training (yes/no participated in training)	109	98	.000	.18	.18	.000
Size and typical value of contract tendered for (<130,000->130,000)	296	284	.000	.32	.30	.000

Thirdly, reported tendering outcomes are not uniform across SME size. To begin with, between group differences are statistically significant in respect of the percentage of SME revenue attributable to public sector contracts. Thus, size is found to influence the proportion of SME revenue derived from doing business with public sector organisations. Mean differences are observable between micro and small enterprises and between micro and medium-sized enterprises but not between small and medium-sized enterprises. The percentage of annual revenue attributable to public sector contracts is lowest for micro-enterprises (16 percent), highest for medium-sized enterprises (24 percent), and 20.5 percent for small enterprises. Perceptions of success in tendering also exhibit variation across SME size. The mean differences between all SME size groups are statistically significant. Micro-enterprises have the lowest perception of success, reporting a score of 2.7 out of 7, small firms report a slightly better score of 3.3 out of 7 and medium-sized enterprises report a still better score of 3.5.

To summarise, the evidence adduced here supports the contention that size is significant in influencing SME tendering. When it comes to SMEs' tendering resources, behaviours, and outcomes size matters. This is especially true of tendering experience, number of tenders submitted annually, and perceptions of success, as suggested by the high F-ratios in each case. Moreover, a distinct pattern emerges from the data. Specifically, the smallest of the SME population, micro-enterprises, are found to be most resource disadvantaged, least active in tendering, and have the lowest rates of success. The opposite is true of the largest SME subgroup, medium-sized enterprises, which are shown to have the strongest resource capacity for tendering, the most active engagement in the public sector marketplace, and the most successful outcomes. Small firms occupy a middle-ground position, enjoying a more advantaged position than micro-enterprises but lagging medium-sized enterprises on some, though not all, tendering dimensions. For example, no statistically significant difference is observable between small and medium-sized enterprises on the extent to which they source public sector opportunities online or in the percentage of total annual revenue attributable to public sector contracts. This leads to the conclusion that while variation exists across SME size categories, it is most pronounced between micro-enterprises and the other two SME groups. The implications of these findings for scholarship and for policy-practice are elaborated on in the concluding section.

IMPLICATIONS

SMEs are central to discourse on public procurement but efforts to explicate their role as suppliers have rarely gone beyond identification of the barriers they encounter or their resource disadvantages relative to large corporations. In focusing on SME disadvantage extant scholarship has overlooked and even discounted disparities in tendering capabilities and behaviours within the SME population. The effect has been to create an artificial impression of SME uniformity as tenderers for public sector contracts. Furthermore, it has contributed to a widespread belief that SMEs, irrespective of their size, sector, ownership structure, or growth intentions are amenable to the same policy remedies. Taking a tentative first step to address this 'insidious assumption of homogeneity' (Pett, Wolff and Sie, 2012), we examined the relationship of size to SMEs' tendering resources, behaviour, and outcomes. Our findings lend support to the position that SMEs do not constitute a single, monolithic entity in public sector tendering and should not be treated as such. This has important implications for research going forward. It suggests the desirability of more fine-grained analyses, with size, sector, age, owner profile, market coverage, legal status, and geographic scope among some of the variables deserving of greater consideration when researching at the SME-public procurement interface. Continued reliance on SME as the unit of analysis means that significant differences within the SME population will remain hidden. As the findings presented here clearly demonstrate, significant variation exists in tendering resources, behaviours, and success outcomes across SMEs of different sizes. In the interests of advancing knowledge of SMEs and their tendering activity, greater attentiveness to size and other organisational variables is strongly recommended.

Coming out of this research is a salutary reminder not to presuppose that SMEs are uniformly disadvantaged when competing for public sector contracts. Implied or assumed in foregoing studies on public sector tendering is a uniform level of disadvantage experienced by SMEs relative to larger corporations. Our findings clearly suggest that disadvantage within the SME population is as real as that existing between SMEs and large corporations. Within the SME population there appear to be varying degrees of disadvantage, something implied previously in the work of Pickernell et al (2011). Micro-enterprises, in particular, operate at a disadvantage in the public sector marketplace when compared to small and medium-sized enterprises. The reasons for this are varied but may include problems already identified in relation to SMEs. These include inexperience, or what Aldrich and Fiol (1994) have termed ‘the liability of newness’, thinly-spread resources (Karjalainen and Kemppainen 2008), poor uptake of training and up-skilling opportunities (Marlow, 1998), and low exploitation of ICT (Abore and Ordanini, 2006). Our identification of micro-enterprise disadvantage in tendering is also resonant with contemporary lines of SME inquiry. In the domain of finance, for example, Beck, Demirguc-Kunt and Maksimovic (2006) determine that size is significant in explaining the extent to which firms are constrained by financial, legal and corruption barriers. Furthermore, a number of studies have variously examined how size affects SMEs’ adoption and deployment of ICT (Admiraal and Lockhorst, 2009; Jones et al, 2012; Laukkanen, Sarpola and Hallikainen, 2007; Levenburg, 2005). Most recently, Jones et al (2012) focused on the experiences and practices of sole-proprietor micro-enterprises and their idiosyncratic ICT needs and preferences. Now added to these observations and contemporary lines of inquiry is our demonstration that SME size significantly influences tendering activity.

That size matters in accounting for SME tendering patterns has implications for public procurement policy. In particular, it raises questions over the efficacy of pervasive ‘one-size-fits-all’ approaches to supporting SMEs. So-called ‘SME-friendly’ measures have been enacted across jurisdictions in recent years to promote participation among small and younger firms in the public sector marketplace. The European Commission’s (2008) ‘Code of Best Practices Facilitating Access by SMEs to Public Procurement Contracts’ being a case in point. However, as SME tendering activity appears to be strongly associated with size, the question arises as to whether ‘SME-friendly’ policy as currently conceived is too blunt an instrument to be effective? In the absence of longitudinal data on this matter any answer would be premature and speculative. While ‘SME-friendly’ policies may improve the general environment for public sector tendering, it is more difficult to discern how they are capable of simultaneously advancing the interests of micro, small and medium-sized enterprises given the differences in tendering abilities and behaviours that exist between them. If current policy is too generic, are bespoke supports for SME subgroups, micro-enterprises especially, the way forward? Again, this question has no easy answers. Arguments in favour centre on the disparity in tendering resources between micro-enterprises and other SME types. In particular, a case can be made that if micro-enterprises are to increase their involvement in public sector tendering they require support measures matched to their idiosyncratic resource constraints, abilities and growth intentions. Against this, multiple ‘SME friendly’ policies may have the effect of introducing additional complexity into the institutional environment (Nooteboom, 1993), not a development SMEs are likely to welcome. As studies suggest that ‘SME-friendly’ policies have not translated into practice in a systematic way (Flynn et al, 2013; Loader, 2013) and can even confuse and frustrate public buyers (Morgan, 2008; Qiao, Thai and Cummings, 2009), consideration of a new policy architecture will have to be broached cautiously.

The findings of this research are prosaic but their implications are important. Essentially, they attest to the importance of size as a significant influence on SME tendering. At a higher level, they reinforce the desirability of research and policy at the SME-public procurement interface moving beyond a simple dichotomy of SMEs versus large firms. Several promising lines of inquiry present themselves for future consideration. As a starting point, the influence of organisational variables other than size on SME tendering are deserving of empirical investigation. These

could include age, sector, market focus, and owner characteristics. Additionally, testing the role of size on SME tendering in other jurisdictions would prove fruitful for either lending weight to or qualifying the findings presented here. Future research could also profit from the inclusion of large firms in the research design and analysis phases. Their inclusion would allow for a determination to be made on whether the ‘disadvantage gap’ between micro and medium-sized enterprises is of a greater magnitude than that between medium-sized enterprises and large corporations. A finding in the affirmative would have ramifications for how we understand SMEs as public sector tenderers, as it would have for the formulation of public procurement policy. Finally, reliable, longitudinal data on the effects of ‘SME-friendly’ policies on micro, small and medium-sized enterprises is urgently required. In the absence of such data it is difficult to evaluate the impact of ‘SME-friendly’ policy to date and, leading on from this, to devise more targeted and effective policy prescriptions.

Notes

1. As defined by the European Union in Recommendation 2003/361/EC, micro enterprises employ between 1-9 staff and have a turnover not exceeding €2 million; small enterprises employ between 10-49 staff and have a turnover not exceeding €10 million; medium sized enterprises employ between 50-249 staff and have a turnover not exceeding €50 million. SME is defined as any business entity having less than 250 employees and not exceeding €50 million in annual turnover.
2. These measures are not legally binding and do not affect EU public procurement law as transposed into Ireland law.
3. As of December 2012 it was estimated that approximately 60,000 suppliers, Irish-based and foreign-based, were registered on www.etenders.gov.ie.
4. As €130,000 is the current EU threshold above which public sector contracts for the supply of goods and services are to be advertised on the Official Journal of the European Union, this value is taken as the separating line between low and high value contracts.

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