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CHARACTERISTICS OF PRIVATE MARKETS AND ACCESSIBILITY OF SMALL AND MEDIUM ENTERPRISES TO PUBLIC PROCUREMENT MARKETS: PHARMACEUTICALS IN EGYPT

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ABSTRACT. The current paper explores the effect of private market characteristics on the access of small and medium enterprises (SMEs) to public markets in some sectors. Using survey data of small and medium enterprises in the pharmaceutical sector in Egypt, we confirmed this effect. We found that regulations of drugs pricing and registration in the private market constrained the capacity of those firms to compete in the public markets. However, some other factors play it the other way. The policy implications of these findings indicate that governments need to account for private markets characteristics when designing support packages for smaller enterprises in public procurement markets.

INTRODUCTION

Public procurement constitutes an important portion of gross domestic product (GDP) in developing countries. It accounts for up to 25–30% of GDP (United Nations Conference on Trade and Development (UNCTAD), 2012). Governments have the opportunity to support small and medium enterprises (SMEs) directly through their purchasing policies. However, public procurement markets (PPMs) are referred to as a conspicuous example of corruption and lack of transparency. Many country studies and surveys have highlighted the negative impact of these symptoms on SME engagement in PPMs (e.g. Decker, Schiefer, & Bulander, 2006; Mutula & Brakel, 2006).

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However, the potential transferred impact of characteristics of private markets to PPMs has not been looked at in the literature as a factor that may reshape, for the better or the worse, the presence of SMEs in PPMs. The current paper aims to explore this issue with application to the pharmaceutical sector taking Egypt as an exploratory case study. The health sector, including pharmaceuticals, is prone more than others to challenges in procurement. Health systems operations and value chains are highly complex. In addition, public procurement in the health sector ranks very high in terms of weak transparency (Transparency International, 2006). In fact, the World Health Organization (WHO) estimated that almost 25% of spending on public procurement in the health sector worldwide is lost due to corruption (WHO, 2007).

Issues of transparency and corruption in Egypt are common, as in other developing countries. According to the European Bank for Reconstruction and Development's (EBRD, 2013) assessment of the legal framework and practice of PPMs in Egypt, the country has problems related to transparency and integrity.

This paper is structured into five sections. Following the introduction, the second section provides the literature review and conceptual framework. The third section describes the pharmaceutical sector and public procurement in Egypt. Our empirical work is in the fourth section. The last section concludes with policy implications.

THE RESEARCH FRAMEWORK

Research on SMEs and PPMs could be categorized into two lines; the first assumes the relation between public procurement and SMEs to be an inter-actor relationship within the public market and the second sees the relationship as an association between actors in two markets. By relationships we refer to the governing rules, regulations and disciplines that control how public agents acquire and exercise authority related to public procurement. Poor governance means vague rules and regulation, which could be accompanied by loose disciplines in exercising authorities (World Bank, 2013, p. 70). This would manifest itself in lack of transparency and corrupt practices and would reflect negatively on fairness of competition.

Most of the existing research lies in the first line. It deals with PPMs as an interface[1] between government actors (organizations, employees, agents, etc.) and SMEs. Studies in this segment highlight the impact of weak, vague and complicated regulations and procedures and the resulting weak governance of PPMs (Eadie, Perera, Heaney, & Carlisle, 2007; Holmes et al., 2009; Vincze et al., 2010; Uasail, 2010; Kaspar & Puddephatt, 2012; Glover, 2008; Rogers, Denton, Biddiscombe, & Kennedy, 2006). These factors create corruption and anti-competitive attitudes which militate against SMEs accessibility to PPMs (Office of Fair Trading, 2004; Fresh Minds Research, 2008; Republic of Uganda, 2010). Accessibility is measured by the number of winning public tenders.

Under the first line of research, we also find many surveys and country studies assessing the challenges faced by SMEs in PPMs. Problematic features were found to be common in many developing countries. Nepotism, bribes, and cronyism are manifestations of corrupt behavior. Moreover, information asymmetry, common embezzlement of public expenditures and collusion create the possibility of corrupt preferential treatment for some companies in some transition countries (Ateljevic & Budak, 2010; Engelbrekt, 2011). Additionally, the legal framework, being weak, may result in corruption as shown by Jones (2009) who studied Cambodia, Indonesia, the Philippines, Thailand, and Vietnam.

Along this line, we sort the research on tools and mechanisms that firms use to affect the governance structure of the PPMs[2]. The legal structure in many countries allows for subcontracting and collaboration in bids. While networking can result in better SMEs accessibility to PPMs, it could also work against them. Collusion among large firms constitutes a challenge for SMEs in PPMs competitions. Also firms can try to influence the rules of the market such as laws, regulations, and perceptions, leading to state capture (Hellman, Jones, & Kufmann, 2000). Nevertheless, state capture most likely works against SMEs as it could result in more stringent pre-qualifications and complicated tender procedure.

Studies falling under the second line of research are very few; yet we can differentiate between types. The first linked the performance of firms in their private markets to that in PPMs. Estache & Iimi (2011) and Withey (2011) directed attention to the impact of performance in private markets on SMEs accessibility to PPMs.

Factors that impact firms in private markets may affect their attitude towards PPMs. Being occupied in private markets would limit SME engagement in PPMs. Additionally, success records in private markets give support to SMEs and encourage them to expand to PPMs. In this context, success in private markets is seen as essential for SMEs to get an opportunity in PPMs. This process of self-selection and preparation may end up with low participation.

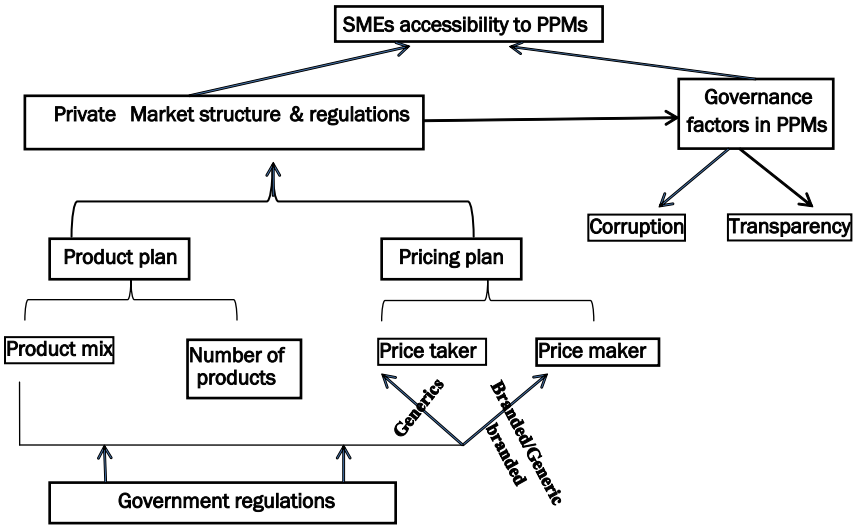
The other type, which lies under this line, combines studies that highlight the interaction among sectoral market structures and governance factors, PPMs and SMEs. The health sector, specifically pharmaceuticals, is a major focus of such studies. In 2010, the World Bank (2010) surveyed manufacturers and suppliers of health sector goods with the aim of improving procurement and highlighted the impediments for SME accessibility. Medicine Transparency Alliance (2014) provided many case studies in this area as well[3]. The World Health Organization (WHO, 2009 & 2010; Kohler & Baghdadi-Sabeti, 2011) provided an analytical framework to measure transparency in the pharmaceutical sector. The framework incorporates eight functions, namely: registration including pricing, licensing of medicine establishments, inspection of drugs manufacturing, promotion, clinical trials, drugs selection, PPMs, and distribution. Findings for the developing countries surveyed recorded a high level of weak governance on average (Kohler & Baghdadi-Sabeti, 2011). Critical vulnerability to corruption and weak transparency were found in the functions of inspection on drug establishment, drug promotion[4] and selection. Comparisons of findings among surveyed countries revealed common weaknesses in the formation and procedural work of committees for drug selection and registration. However, case studies which used the WHO framework went into assessment of each element separately in isolation of others. The interaction of aspects of PPMs with any other areas or functions, were not looked at. Hence, the potential combined impact was not recognized or assessed before.

Our argument goes as follows. There is a carry-over effect from private market characteristics, including structures and regulations, to the public market. While governments set sectoral regulatory policies to impact the private market, their influence may trespass to the public market. Additionally many internal structure created by the private market to facilitate doing business will extend itself to PPMs.

Moreover, as previous studies showed, performance in private markets stretches itself to shape firm attitudes in PPMs. The current paper considers those elements altogether in one framework and questions their possible interaction with factors of transparency and corruption in PPMs. Then it explores its impact on SMEs performance in PPMs.

Figure 1 summarizes the main idea and displays how it works in pharmaceutical sector. Success factors in private markets are based on the competitive position of the firm, which is based on its production and pricing policies. Both are affected by government sectoral factors such as regulations of registering new products and pricing. In developing and least developed countries, government policies are seen as highly impactful on the performance of firms (Roberts & Riech, 2011, p.1). The firm's competition strategy depends on the nature of its products (drugs); i.e. originators (brands) or generics (Danzon, Mulcahy, & Towse, 2011). SMEs are likely to be players in the generic segment of the market. It means that their

FIGURE 1
The Research Framework



competitive strategy depends on relatively lower prices and networking with service providers through incentives to create a semi niche market for their generic products.

Weak governance in implementing regulations because of lack of transparency or corruption, would affect the production and pricing of products. In turn, this impacts the performance of firms in private markets. Danzon, Mulcahy, and Towse (2011) calculated that generics are generally priced less than their originators by almost 47%. Therefore, market shares in private markets are important to support the firm financially so it is able to offer discounts that reach 28% in PPMs (Danzon, Mulcahy, & Towse, 2011). Additionally, Private market agents' structure has an impact on the capacity of SMEs to connect to the value chain. Persuasion, advertisement and other tools for information dissemination play a vital role in gaining market share in private markets (Hurwitz & Caves, 1988). Their influence is expected to spillover to PPMs in developing countries where physicians of public sector are involved in both private markets and PPMs. While they have private clinics, they also work in public hospitals.

On the other side, we expect that any point of strength in private markets structure would stretch its positive impact to PPMs in a way that would level up the playing field for SMEs. In Figure 1 we depict factors in both private markets and PPMs. We will consider these factors, as well as their interaction, in our empirical analysis in order to assess our proposition. While the figure shows a one way relation from private markets to PPMs, previous literature assured the importance of the other way relation from PPMs to private markets. For instance, the success in PPMs supports SMEs to grow in private markets (World Bank, 2010; Kohler & Baghdadi-Sabeti, 2011). Also all of the above factors, whether negative or positive, could be linked to fairness of competition in both markets. However, a full-fledged analysis of this type is beyond the scope of this paper.

PPMs AND PHARMACEUTICALS IN EGYPT

This section provides an orientation to our case study. It provides a comparative understanding of the pharmaceutical private and public markets in Egypt through a comparison between factors of transparency and corruption in private markets and PPMs of

pharmaceuticals with other developing countries. In addition it sheds light on channels of weak governance of transparency and corruption.

Egypt's Pharmaceutical Private Market

The Egyptian pharmaceutical private market comprises two types of companies; suppliers and distributors. In 2012, there were 530 drug suppliers through direct manufacturing or importing[5]. The concentration ratio of production among the biggest ten suppliers is almost 50%. However, the concentration level is relatively low as the Herfindahl-Hirschman Index (HHI) in 2011 was just 390.04%, [6] indicating an important role of SMEs in the sector.

The second type of companies in the pharmaceutical market, distributers, are only 10 companies that have widespread distribution channels and warehouses all over the country. Recently, they have started to provide other services in public procurement market of pharmaceuticals, such as disseminating data on previous public tenders. Moreover, they play the role of facilitators between SMEs and the public tenderers where SMEs subscribe through them to public tenders. The support provided includes not just the provision of logistical services, but also financial (collateral letter) and technical support.

The private pharmaceutical market turnover (retail and wholesale market of pharmacies and private hospitals) stood at USD 4.1 billion (Business Monitor International (BMI) 2012). This is equal to 1.9% of GDP and 30.6% of health expenditure (BMI, 2011b) in the country. The Chamber of Pharmaceuticals[7] in Egypt estimated sales revenues through public procurement to be up to one third of the revenues in the retail market in 2011, but no published data is actually available on pharmaceutical PPMs in Egypt[8].

Egypt's pharmaceutical sales are divided into three main drug categories: patented and multinational company drugs (originators), generic, and over the counter. The overall sales mix in 2010 was as follows: 57% patented drugs, 27% generic drugs and 17% over the counter drugs. This sales mix changed in 2007 with the percentage of generic drugs increasing at the expense of patented and multinational company drugs. This trend is expected to continue in the long term (BMI, 2011b).

Governance in the pharmaceutical sector shares elements of the transparency problem framework highlighted by the WHO (2009). The World Medicines Situation study of 2011 (Kohler & Baghdadi-Sabeti, 2011, p. 6) applied WHO unified framework of analysis for transparency and corruption in applying government regulations. The study found that 18 out of the 25 developing countries surveyed suffered from transparency problems in the selection of registration committees and their operating policies and procedures, in addition to the presence of conflicts of interest.

Abd Elsalam (2011) used the same WHO methodology to assess governance of the sector in Egypt. Figure 2 compares her results with those of Kohler & Baghdadi- Sabeti (2011). It is clear from this data that Egypt has an issue with transparency and there is a moderate issue of vulnerability to corruption[9]. Egypt's score is almost in the average range of results obtained previously for other developing countries.

Table 1 displays the detailed results of Abd Elsalam (2011). It is clear that, in the area of governance of registration, Egypt's highest vulnerability is related to forming committees and setting work procedures; otherwise it has a moderate status.

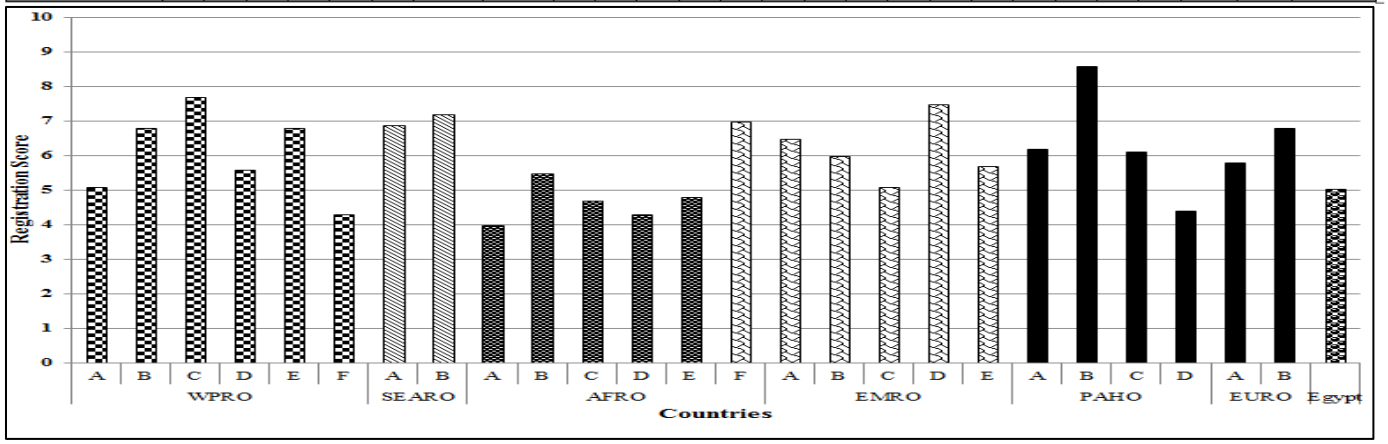
Drug pricing in Egypt is administrated by Ministry of Health and Population (MoHP) through registration committees. Figure 3 depicts the process of registration and pricing. The registration process starts with clustering drugs according to some equivalent criteria. .In particular, drugs can be clustered "according to: chemical (identical products with same active principle); pharmacological (chemically different but pharmacologically related drugs); or, therapeutic equivalence (all drugs used to treat a particular condition)" (Galizzi, Ghislandi & Miraldo, 2011).

Then follows the pricing process where a reference price for each cluster is defined. The general rule is that the price of the originator is the average of its price in a selected set of comparably socio-economic countries. Generic prices are reduced by 60% of the reference prices of the originator product for the first subscriber - and then reduced by 10% for each successive subscriber.

Prices, however, can be negotiated based on the country of origin of imported materials and the range of innovation introduced to

FIGURE 2
Transparency Status and Vulnerability to Corruption

	WHO Regional Office for Western Pacific (WPRO)						WHO Regional Office for South-East Asia (SEARO)		WHO Regional Office for Africa (AFRO)						WHO Regional Office for the Eastern Mediterranean (EMRO)					WHO Pan American Health Organization (PAHO)				WHO Regional Office for Europe (EURO)		Egypt
Country	A	B	C	D	E	F	A	B	A	B	C	D	E	F	A	B	C	D	E	A	B	C	D	A	B	Egypt
Registration Score	5.1	6.8	7.7	5.6	6.8	4.3	6.9	7.2	4	5.5	4.7	4.3	4.8	7	6.5	6	5.1	7.5	5.7	6.2	8.6	6.1	4.4	5.8	6.8	5.04



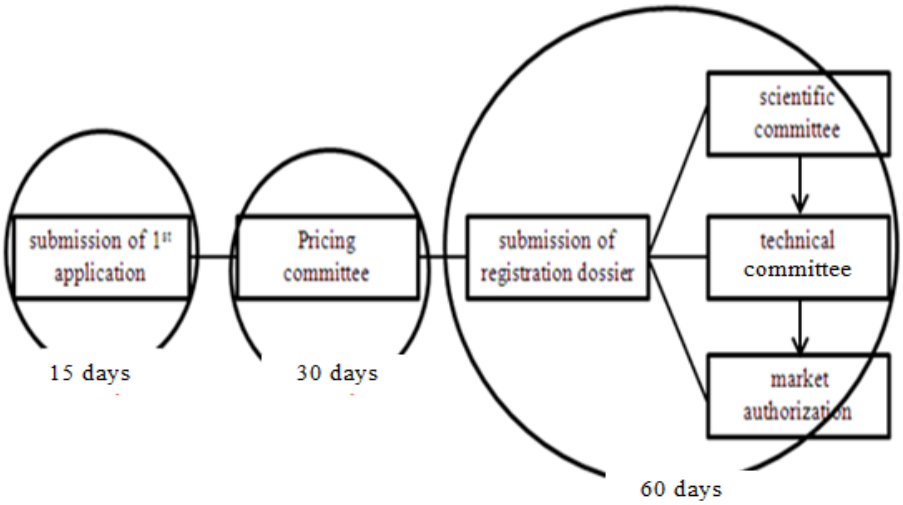
Source: For Egypt: Abd Elsalam (2011, p. 54). For other countries: Kohler & Baghdadi-Sabeti (2011, p. 15).

TABLE 1
Scores for Each Registration Indicator

No.	Indicator	Score
1.	Is there an up-to-date list of all registered pharmaceutical products available in the country?	0.57
2.	If such a list exists, does it provide a minimum level of information?	0.48
3.	Are there written procedures for applicants on how to submit an application for registration of medicinal products?	0.74
4.	Are there written procedures for assessors on how to assess applications submitted for registration of medicinal products?	0.38
5.	Is there a standard application form publicly available for submission of applications for registration of medicinal products?	0.76
6.	Are there written guidelines setting limits on how and where medicines registration officers meet with applicants?	0.69
7.	Is there a functioning formal committee responsible for assessing applications for registration of pharmaceutical products?	0.93
8.	Are there clear written criteria for selecting the members of the committee?	0.08
9.	Is there a written document that describes the composition and terms of reference of the committee?	0.25
10.	Are there written guidelines on conflict of interest (COI) with regard to registration activities?	0.09
12.	Are there clear and comprehensive guidelines for the committee's decision-making process?	0.15
13.	Is there a formal appeals system for applicants who have their medicine applications rejected?	0.93
	Total	0.504
	Final score	5.05

Source: Abd Elsalam, 2011, p. 36, Table 3.

FIGURE 3
Registration Process in Egypt



Source: Based on Abd Elsalam (2011, p. 52).

Geneirics.[10] This pricing policy, considered predatory, has been strongly critiqued. Among the reasons of this criticism is that the deviation from free competition has led to distortions and unfair competition.

In addition, MoHP restricts competition in the market by limiting the number of generics (chemical or pharmacological) allowed to be registered in each drug cluster Egypt, to ten products. This policy named the "Box" was created under the justification of saving companies from fierce competition and nudging them to direct their resources to other boxes that still contain less than ten generics.

Like elsewhere, doubts on the effectiveness of generics may be used against SMEs. Not all companies can afford good dissemination of information about their drugs; therefore developing relations with physicians as service providers is critical. Yet, it could open a door for corruption as physicians working in the public sector are allowed to run private clinics as well. The WHO acknowledged that the function of medicines promotion suffered from a recognizable degree of weak

governance in most developing countries. Out of 21 surveyed countries, 20 countries recorded moderate to extensive vulnerability in this area (Kohler & Baghdadi-Sabeti, 2011, p. 6, Table 1.1). Last but not the least, the process of registration in practice is lengthier and extended much more than the periods officially set.

Public Procurement Market for Pharmaceuticals

Law no. 89 for 1998 for public tenders and auctions, named Public Procurement Law, controls participant interactions and the practice of authority related to PPMs. In Egypt, two public authorities oversee and audit PPMs. The first is the Public Authority for Governmental Services (PAGS), which has a mandate to oversee procedures relevant to law implementation; it makes sure that the bidding process in terms of actions, timing, and actors' interactions are in accordance to law. One of those actions is information dissemination about bids including all the required details as required by the law. Recently, PAGS was assigned the task of directly keeping SMEs- who are all entitled to register for this service- informed of new public bid openings. . The second authority that oversees PPMs, the Central Audit Authority (CAA), does post-auditing of all public bids to assure compliance with law.

The EBRD (2013) conducted a comparative assessment of PPMs in Egypt, Jordan, Tunisia, and Morocco in addition to the Organization for Economic Co-operation and Development (OECD) countries. Table 2 summarizes results of that assessment.

Generally Egypt's record regarding the status of the regulatory and effectiveness gaps of integrity, as an anti-corruption status, and transparency, was found moderate. Specifically to SMEs, common features of moderate corruption, non-existent accountability measures, difficulties in tracing contract opportunities, and the impact of favoring large bidders, are pinpointed and highlighted as impediments to the accessibility to public tenders (Kaspar & Puddephatt, 2012). Ahram Center for Political and Strategic Studies (ACPSS) and Center for International Private Enterprise (CIPE) (2009) indicated that misperceptions and inconsistency in the performance of government offices add to obstacles facing SMEs engaged with government agencies. It was proposed by them to simplify and review regulatory frameworks and procedures in order to overcome the

TABLE 2
Egypt's Rank in Integrity and Transparency

	Integrity	Transparency
Very high compliance	Turkey, Mongolia, Hungary	Albania, Georgia, Latvia, Estonia, Slovak Republic, Hungary
High compliance	Albania, Kazakhstan, Russia, Georgia, Bulgaria, Latvia	Turkey, Montenegro, Croatia, Kazakhstan, Slovenia, Lithuania
Medium compliance	Montenegro, Croatia, Serbia, Armenia, Kyrgyz Republic, Azerbaijan, Tajikistan, Belarus, Moldova, Lithuania, Slovak republic, Poland, Egypt, Morocco, Jordon, Tunisia	FYR Macedonia, Bosnia and Herzegovina, Serbia, Armenia, Kyrgyz Republic, Mongolia, Tajikistan, Belarus, Russia, Ukraine, Bulgaria, Romania, Poland, Egypt, Tunisia
Low compliance	Slovenia, Romania, Estonia, Bosnia and Herzegovina, FYR Macedonia	Moldova, Jordan
Very low compliance	Ukraine, Uzbekistan, Turkmenistan	Turkmenistan, Azerbaijan, Uzbekistan, Morocco

Source: authors based on (EBRD, 2013) for Egypt, Morocco, Jordan & Tunisia & (EBRD, 2010) for other countries.

problems created by the gap between the regulatory framework and implementation.

Kaspar and Puddephatt (2012) also pointed out that in the area of public procurement there exists a divergence between the SMEs law no. 141 for 2004 (Small and Medium-Sized Enterprises Development Law in Egypt) and its implementation. The Ministry of Foreign Trade (2002) indicated that the extra costs and burdens of dealing with SMEs may lead to a preference for larger firms. These costs may come in the form of reviewing and assessing small bids as opposed to large ones; social costs incurred when sacrificing

economic efficiency; and the drawbacks of violating the terms of international trade agreements when including non-tariff barriers as a form of protectionism. This may be seen as an inconsistency with the law on SMEs as the law states that SMEs must supply 10 percent of the value of all government procurement. While the law is attempting to encourage the access of SMEs to PPMs, it is not functioning in practice. In reality, neither of the authorities (PAGS and CAA) track information on the degree of SME access to PPMs or related to the profiles of bidders. However, this is not odd when compared with other countries. At least 63% of OECD countries do not track this issue (OECD, 2013, p.18). Moreover, none of the by-laws on public procurement or SMEs in Egypt delineate procedures, such as lots division, or rules guiding or compelling actions for public actors to facilitate the accessibility of SMEs to PPMs. Nevertheless, it is worth mentioning that two thirds of the OECD countries do not have such regulations (OECD, 2013, p.13). Additionally 32% of those OECD countries that have such a regulation do not make it mandatory (OECD, 2013, p.18).

Table 3 highlights some of the negative implications of public procurement law (and its executive regulation) for SMEs.

Other requirements of the law are also difficult for SMEs. For example, the law indicates that, the public agency has the right to amend the contract, either increasing or decreasing the requested quantities with the same prices and specifications[11]. We reviewed supplied quantities for two tenders that took place in August 2007. We found procurement under those tenders was in progress until August 2012. Increase in quantities supplied was at least one and half times the tender quantity and not limited to 25% as per the Law[12]. Governmental agencies also have the right to renew contracts without changing the prices and specifications until the completion of new tender. Government also has the right to oblige companies to continue supplying items if those are not included in subsequent tenders. It is worth noting that most of these tenders don't specify the exact increase or decrease that could imposed on bidders in amended contracts. This increases bidding risk as increases or decreases in quantities can affect supplier costs. This burden is particularly heavy on SMEs.

TABLE 3
Analytical Overview of Public Procurement Law from the Perspective of SMEs

Stages	Regulations and Rules	Theme	Content	Challenges
Preparing	Articles No. (1), (3), and (4).	Methods of public procurement	• Identify the different methods of public tendering. • Identify the cases for applying short list and restricted tendering. • Highlight the maximum value for applying local short list tendering approach.	The articles are broad and loose and may lead to unfair competition against SMEs. For example article no.(3) deals with the case of short list tendering without providing the proper definitions and conditions, in a clear manner. The article or the regulations also do not provide the full meaning of the financial and technical conditions which the contractor and supplier should meet. This leads to over qualification that SMEs cannot deal with.
	Articles No. (2)	Macro-rules of public tendering	Emphasize the necessity of enforcing transparency, and openness and providing equal opportunities in public tenders and auctions.	The article is broad. In addition, it doesn't propose any follow-up and assessment of implementation. Also in practice drug tenders usually have an article stating that the public authority is not obligated to disclose the reasons for refusing bidders.

TABLE 3 (Continued)

Stages	Regulations and Rules	Theme	Content	Challenges
Preparing	Articles No. (7), and (8).	Delegation and discretion	• Identify the threshold of direct contracts for minsters. • Delegate the Prime Minister in absolute necessity the authority for direct contracting.	The articles are very loose. They don't identify the full meaning of "absolute necessity" it provides a great deal of authority to tenderers without any restrictions. Regulations do not elaborate on them.
	Article No.(14)		Emphasizes the responsibility of all administrative units to keep a record including a database of all contractors and suppliers.	The article, or any other regulations, doesn't identify any follow-up and assess-ment mechanisms. Records available are very difficult to be retrieved.
Awarding	Articles No.(16), (19), (38), and Article No(134)of executive regulations	Preferential treatments	Give govern-mental units which are subject to public procurement law no.89 for 1998 the discretion to contract with each other through direct agreement, and delegate each other in holding contracts of specific task	While article no. (2) of the law emphasizes the equal opportunities position, granting this preferential treatment for the public units might open the door for unfair competition between private sector, especially for the smaller companies, and public sector companies.
	Article No. (37)	Tender disaggregation	Disallow the combining of tenders disaggregation in order to circumvent the rules, conditions, and procedures of the law	This article has prevented any tender disaggregation. Administrative units usually resort to aggregated bid to avoid any contradiction with the law. Actually these practices hinder SMEs competitiveness in public tenders.

TABLE 3 (Continued)

Stages	Regulations and Rules	Theme	Content	Challenges
Procuring	Article No. (23), and Article No. (94) of executive regulation	Penalties of procuring delay.	Give governmental units the authority to approve the extension of deadlines for the supply of awarded items. Give them the authority to set a penalty of 1% of the value of delayed items for each week of delay or part of week, to a maximum 3%	It led government units to continue requesting supply and don't close the tender, especially in cases of goods such as drugs that are always requested, giving the cost of doing an new tender. Also there are no written regulations for the procurement schedule.

To conclude, Egypt's pharmaceuticals private market and pharmaceutical PPMs have issues with transparency and corruption However, Egypt does not represent a unique case. Compared with other developing countries, Egypt is almost in a middle scale of transparency and corruption indicators of pharmaceutical PPMs and pharmaceutical private market. Negative implications of qualification criteria, time and schedule of procurement, weak transparency of registration committees, drug promotion, and ambiguity in legal provisions are some of symptoms of weak governance in pharmaceutical private market and pharmaceutical PPMs in Egypt as well as in many other developing countries.

EMPIRICAL WORK

This section empirically handles our proposition of the transferred influence of pharmaceutical private market to pharmaceutical PPMs. The paper explores and tests this proposition through using a micro set of data collected from interviewing a stratified sample of companies both large and SMEs working in the pharmaceutical sector in Egypt.[13] We conducted the interviews using one questionnaire to ensure consistency in data. In addition we did five structured interviews with five distribution companies to explore their

role in pharmaceutical PPMs. Information on sampling, stratification and reclassification can be found in Appendix A.

We utilized the framework of analysis in Figure 1 to build the questionnaire used in the interviews. The questionnaire was divided into six sections, starting with company information which focused mainly on labor and production facilities (8 questions). The next two sections comprised questions related to companies' perception of governance in the sector including MoHP policies on drugs registration, pricing regulations and the Box policy, as well as information on number of licensed and produced drugs (15 questions). The fourth section gathers information about company interest in applying to pharmaceutical PPMs and their view of the challenges facing them related to size, collusion, favoritism and others (58 questions). The fifth section profiles the role played by distribution companies in SMEs' accessibility to pharmaceutical PPMs (17 questions). Finally, section six seeks SMEs' recommendations for better accessibility (15 questions).

The produced set of data is used to perform two tasks; firstly to explore our proposition, then secondly to empirically test its validity.

Exploring the Proposition

Profile of companies

Our survey results reveal that large companies are in a better situation regarding production capacities. All surveyed large companies have at least one factory. This percentage goes down to just 42.5% for SMEs. None of the large companies has a utilization rate for its production facilities less than 80%, whilst, 57.5% of SMEs have utilization rate less than 50%. On the other side, competition in the market is high. Most of products are substitutes and price differences are relatively small. Just 20% of drugs produced by SMEs have five or less substitutes. While prices are fixed by MoHP in the retail (consumer) market, they trend downwards in the wholesale market, where all firms have to offer discounts for pharmacies. 64% of surveyed SMEs regarded lower prices as the strategy to compete in the wholesale market. Additionally, all firms compete in the same local markets and import their inputs from almost the same international markets.

Status in pharmaceutical PPMs

Results show that all firms, including SMEs, were found to be interested in pharmaceutical PPMs. They seek pharmaceutical PPMs opportunities and subscribe to tenders; however, the larger companies are more likely to be awarded the tenders (Table 4).

TABLE 4
Firms' Attitudes towards Pharmaceutical PPMs

Indicators based on survey questions	Size		Total
	SMEs	Large	
% firms that seek information on public bids	78.8	100	81.1
% firms that subscribe to public bids	76.3	100	78.9
% firms that have a winning history	73.8	100	76.7
% awarded bids to total subscriptions	57.3	82.5	60.8

Transparency

Despite all the facts about weak transparency in the public market, the survey indicates that transparency is high in pharmaceutical PPMs. Table 5 shows the perception of interviewees to aspects related to flow of information on previous tenders. This is highly important in shaping not only the decision to apply, but it also leads to better preparation of offers and quotations. The questionnaire included question on availability of information on quantities and prices of previous bids in addition to a question on transparency related to making public the reasons for denial of awards. The importance of that variable is that it adds to the learning curve of SMEs. Information on previous tenders (awarded companies, price and quantities), it was found, is not officially published; distribution companies, however, collect this information and make it available to their customers. More than 60% of surveyed SMEs seek information from distribution companies. Other sources of information are private companies specialized in following up public tender news. Also networks of company representatives are important channel. The latter constitutes the most important source of information for large companies. Also this source allows for diffusion of information on tenders before they are advertised

officially, which gives advantages to large companies as it gives more time to prepare for the tender. As results of Table 5 show, large companies are better informed compared to SMEs. However, the transparency level for the overall market is relatively high.

Contrary to the above, transparency of information on opportunities to register new products and the methodology of pricing new drugs was found to be low. While companies can collect information from the market on products already on sale, information on products in the queue is not available. Moreover, companies are never fully informed about the pricing methodology and no definite or clear answer is available.

Also Table 5 provides more evidence on the unfavorable status of SMEs regarding lack of transparency on pricing and registration. Their perception to the vagueness in the market is higher than the large companies. Interesting to mention than while 41% of SMEs rejects the "Box" policy as being against fair competition, 70% of large firms supports this policy.

TABLE 5
Transparency of Pharmaceutical PPMs and Pharmaceutical Private Market Regulations

Indicators based on survey questions	Company Size		
	SMEs	Large	Total
Transparency of pharmaceutical PPMs			
% information on awarded company in previous tenders are available to companies	90.16	100	91.55
% information on procured quantities in previous tenders are available to companies	80.33	100	83.1
% information on awarded price in previous tenders are available to companies	85.25	100	87.32
% of companies which were given the reasons for losing the tender	70.49	100	74.65
Channels of information on opportunities in pharmaceutical PPMs			
% of companies that gather information from Distribution Companies	81.0	60.0	78.1
% of companies that gather information from the website for government procurement	30.2	20.0	28.8

TABLE 5 (Continued)

Indicators based on survey questions	Company Size		
	SMEs	Large	Total
% of companies that gather information from their representatives network	11.1	30.0	13.7
% of companies that gather information from newspapers tenders agents	9.5	10.0	9.6
% of companies that gather information from companies specialized in following tenders	7.9	10.0	8.2
Transparency of pharmaceutical sector			
Registration (% of companies)			
% of companies that consider the number of drugs in a box as available information	23.1	50.0	25.0
Pricing methodology (% of firms)			
Based on the opinion of the Committee	72.5	40.0	68.8
Based on the cost of the raw material	45.0	90.0	47.9
Based on the country of origin of raw material	21.2	40.0	23.3
Based on rank in the box	13.7	0	12.2
Relative to prices of substitutes in the local market	4.5.0	10.0	5.5

Corruption

Regarding corruption, questions involved the three aspects of corruption as highlighted by Jones (2009) and quoted in Kaspar & Puddephatt (2012): bribery, cronyism/favoritism, and collusion. Results highlighted practices that lead to manipulation of tender technical conditions in favor of specific companies. Personal relations outside the public tender market seem to be important. Collusion in terms of phony bidding and bid rigging also appears. As survey results indicate (Table 6), large companies are more likely to rely on collusion and market segmentation, while SMEs prefer the manipulation of tender technical conditions, which partially involves bribery and favoritism.

TABLE 6
Features of Corruption in Pharmaceutical PPMs (In %)

Indicators based on survey questions	SMEs	Large	Total
Bids are often awarded to specific companies	26.2	20.0	25.4
Companies collude to award the bid to one of them	8.2	20.0	9.9
Companies collude to divide the bids among themselves	21.3	40.0	23.9
Physicians' experience in their private clinics could impact awarding in pharmaceutical PPMs	41.0	70.0	45.1
Bid technical qualifications favor some companies in particular	100.0	100.0	100.0
pharmaceutical PPMs favor large companies	87.5	50.0	80.0
Rivals spread rumors on effectiveness of drugs to impact awarding in pharmaceutical PPMs	37.7	40.0	38.0
Rumors actually affect awards	43.5	75.0	48.1
Prevalence of pre -qualification conditions impact awarding in pharmaceutical PPMs	44.6	60.0	47.0

Success Factors

The age of the company and number of products have a major impact on company capacity to apply to pharmaceutical PPMs. The same applies for number of products. While the median of products of SMEs is 20 products, none of the large companies has less than 70 products. Therefore, MoHP's policy towards pricing and registration is expected to have an impact on accessibility of firms to pharmaceutical PPMs. Better registration and pricing polices support companies to apply for pharmaceutical PPMs. Companies perceive drugs requested in pharmaceutical PPMs as a signal of which additional drugs they might register. Also better policies[14] are considered of high importance for accessibility to pharmaceutical PPMs (Table 7).

TABLE 7
Factors Qualifying to Apply to Pharmaceutical PPMs (Based on Survey Questions)

	SMEs		Large	
	Number of responses	% of responses	Number of responses	% of responses
Primary factors qualifying companies accessing pharmaceutical PPMs (N = 67)				
Years of experience	32	65.0	2	50.0
Number of drugs	29	59.0	2	50.0
Turnover value	6	12.0	1	25.0
Factors seen as important to encourage companies to apply for pharmaceutical PPMs (N = 138)				
Drugs required in bids are indicative of drugs for which successful registration efforts might be made	46	73.0	10	100.0
Better registration policy	47	58.8	8	80.0
Better pricing policy	45	56.3	7	70.0

Testing the Proposition

To test our propositions and assess the most significant governance grabbed from pharmaceutical PPMs and pharmaceutical private market affecting SMEs performance in pharmaceutical PPMs, we conduct a multiple regression model. The dependent variable is the percentage of awarded tenders over the last five years as a proxy for the accessibility of the public tender market to SMEs. The explanatory variables are two composite indices for transparency and corruption of pharmaceutical PPMs. Composite indices have the ability to summarize complex or multi-dimensional issues in a simple manner. To capture specific effects of weak governance of policy regulations in pharmaceutical private market the model was fed by additional specific variables. They are two indicators on Box policy: the status of specific Box which the firm is interested to register in and the general perception of Box policy as a tool to restrict

competition. The other two indicators on the transparency of the regulations based on assessment of companies for transparency of pricing and registration policies.

The two pharmaceutical PPMs composite indices of transparency and corruption were constructed based on data collected from our survey[15]. Table 8 shows the variables used in each composite index. In addition, the table shows the difference between SMEs and large firms in their perception of transparency and corruption issues as composite phenomena. For details on the composite indices, the model tests and Hickman selection test see Appendix A.

TABLE 8
Construction of Composite Indices

Dimension	Indicators based on survey questions	Company Size		
		Small	Large	Total
Transparency index	Information on awarded companies in previous tenders	81.557	100	84.15
	Information on awarded quantities in previous tenders			
	Information on awarded prices in previous tenders			
	Reasons provided for not awarding the tender			
Corruption index	Bids are often awarded to specific companies	24.59	35.00	25.78
	Collusion among companies to award the bid to one of them			
	Collusion among companies to divide the bids among themselves			
	Influence of personal experience of public agents (physicians) regarding drugs on awarding the tender			
	The technical conditions favor specific companies			
	Impact of rumors on the effectiveness of a drug on the awarding of the tender			
	Impact of conditions of previous qualifying experience in the bids			

Stepwise regression analysis is then used to assess the magnitude and direction of each independent variable on the dependent variable (% awarded bids). The stepwise multiple regression model was run using SPSS Package with all 6 predictors and produced a model in which $R^2 = .935$, $F= 241.126$, $p < .001$.

The results (Table 9) indicate a statistically significant relationship between the two independent variables of transparency of pharmaceutical PPMs and registration policy, with the percentage of awarded bids as the dependent variable. The result indicates that 87.1 percent of the variance in the total bids awarded has been significantly explained by those two transparency factors.

It is interesting to note that both transparency factors are part of the pharmaceutical private market characteristics. Transparency of pharmaceutical PPMs, as shown by its composite index in Table 8, is a function of the positive work done by the distribution companies in providing information to all firms. Additionally the model confirms that any improvement in the transparency of the registration policy would improve the accessibility to pharmaceutical PPMs. Factors related to corruption were found to be insignificant. Factors related to the box policy in general or the specific status of any box was also found to be insignificant. Finally, transparency of pricing policy was found to be insignificant which is explained by the fact that the pricing policy imposed by MoHP on companies does not apply on pharmaceutical PPMs where each company forms its own bidding strategy.

TABLE 9
Regression Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Transparency variable of pharmaceutical private market	0.195	0.041	0.520	4.738	0.000
Transparency index of pharmaceutical PPMs	0.325	0.082	0.435	3.963	0.000

While model results apply to the whole market, implications for SMEs could be deduced given the difference of transparency levels as shown in earlier responses based on survey results. The level of pharmaceutical PPMs transparency was found to be higher for large firms than for SMEs and perceived transparency in pharmaceutical private market regarding the regulatory policy is also higher for large firms than SMEs. That is to say while transparency is important in the awarding of public tenders, given the context in the sector, model results show a lower probability for SMEs to be awarded the tender due to the higher level of transparency that larger firms enjoy.

CONCLUSION

The current paper aims to broaden the context of analysis of factors that hinder SME accessibility to public procurement markets. The conventional vision focuses on the transparency and corruption challenges in those markets. Our work directs policy attention to additional dimensions of reform. This alerts to the possible failure of reform packages that limit their actions purely to public tender problems.

We argue that factors impacting the success of SMEs in the private market carry over their impact into the public tender market. We collected micro data for SMEs in the pharmaceutical sector in Egypt to explore our proposition. Egypt could be seen as an example of a developing country suffering from the challenges of a moderate level of transparency and corruption in public procurement markets and in regulations controlling the private market, in a way comparable to other developing countries.

Our findings showed that some of the features of the private market present solutions for some of the defects of the governance of public tenders. However, other features complicate the problem. Nevertheless, our analysis provides evidence that governance problems of private market outspread their sectoral domain and inhibit SMEs' accessibility to public markets in a way that supersedes the common known problems of public tender markets. However, our results should be interpreted in their context, as highlighting a new dimension of analysis that would invite more research.

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NOTES

1. PPMs is not the only interface between government actors and firms. Utilities, taxes, and judicial system are others.
2. Governance comprises also accountability and fair competition.
3 Data of the Medicine transparency Alliance could also be retrieved from www.who.int/medicines/areas/coordination/meta/en.
4. Along the current paper, we use the words "drugs" and "medicine" for the same meaning.
5. As of data of the sector for the year 2012 produced by www.IMShealth.com.
6. Herfindahl-Hirschman Index (HHI): uses the market shares of all the firms in the industry, and these shares are squared in the calculations to place more weight on the larger firms. $0<HHI=S_1^2+S_2^2+\cdots+S_n^2\leq 10{,}000$. If HHI is less than 1000, the market is a relatively unconcenterated market. If $1000\leq HHI\leq 1800$, represents a moderately concentrated market.
7. Through interview with the Chamber representative.
8. In Egypt public procurement amounted to 17% of GDP in 2011.
9. Authors conducted four interviews with head of the Pharmaceutical Department in MoF, head of the Registrations Division, chairperson of the Registration Committee, and head of the Information Technology Center in MoHP. Questions addressed covered the methodology of registration and pricing, in addition to the Box policy.

10. Based on interviews with two members of the Registration Committee and the ex-chair of Department of Pharmaceuticals in MoHP.
11. This condition was amended in tenders for construction sector in order to compensate contractors for increases in material prices during procurement period.
12. As reported by distributing companies between the 4 months; January 2012-April 2012.
13. Based on the data set for the pharmaceutical companies for 2012 produced by IMShealth.com. In the absence of a formal definition SMEs in the pharmaceutical sector in Egypt, SMEs were defined as companies with less than LE 200 million value of turn-over and less than 250 workers, based on interviews with representatives of two commercial banks working in Egypt that are involved in lending companies in the pharmaceutical sector, in addition to interviews held with CEOs of three SMEs working in the sector.
14. Interviews shed light on a mixed perception of box policy; in one front it restricts SMEs from expanding their portfolio, nevertheless, it protects them in their markets in the narrow sense.
15. Scale transformation of data: The majority of the variables that have been used for different composite indices were having the same scale while for some other indicators/variables, the study made rescaling and reversing to standardize all the final variables to be ranged from 0 to 100.
    - Weighting: There is no theoretical evident in the literature to tell if one of the indicators are more important than the other so the study used equal weights for all indicators.
    - Aggregation: The technique used for composite indices was the additive aggregation method (Simple Averaging) per company.

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APPENDIX

Sample Construction

In our sample, SMEs are defined as companies with a turnover of less than LE 200 million (less than $30 million). Also the sample SMEs are not a subsidiaries of a multinational or public enterprise. The sample is designed to be a proportionally stratified random sample by dividing the population pharmaceutical companies in Egypt (530 companies) into two strata; large companies and SMEs, 2011 sales revenues of was used as a proxy for company size. The total sample size was selected according Cochran's sample size formula (Bartlett, Kotrlik, & Higgins, 2001).

$$n_o = \frac{(t)^2 * (s)^2}{(d)^2}$$

Where
t = value for selected alpha level
s = estimate of standard deviation in the population
d = acceptable margin of error for mean being estimated

A critical component of sample size formulas is the estimation of variance in the primary variables of interest in the study which is the proportion of awarded bids to all bids (no. of awarded bids/no. of all

bids). One of methods identified by Cochran (1977) to estimate the population variance for sample size determination is taking the sample in two steps, and using the results of the first step to determine how many additional responses are needed to attain an appropriate sample size based on the variance observed in the first step data. Accordingly, we selected a first step sample of size equal to 30 firms then used it to calculate the standard deviation which equals 0.262. The calculations would be as follows for the sample size formula:

$$n_o = \frac{(1.96)^2 * (0.262)^2}{(0.05)^2} = 108$$

Where

t = value for selected alpha level of .025 in each tail = 1.96 (For the level of confidence of 95%).

s = estimate of standard deviation in the population from the first step data = 0.262.

d = acceptable margin of error for the mean being estimated (Cochran (1977)) = 0.05.

Therefore, for a population of 530, the required sample size is 108. However, since this sample size exceeds 5% of the population (530*.05=27), Cochran's (1977) correction formula should be used to calculate the final sample size. These calculations are as follows:

$$n = \frac{n_o}{1 + \frac{n_o}{N}} = 90$$

The sample was stratified using the following equation:

$$n_h = (N_h / N) * n$$

Where

n_h = the sample size for stratum h,

N_h = the population size for stratum h,

N = total population size,

n = total sample size.

We started with a sample size of 134 to allow for nonresponses. The response rate for companies originally contacted was 68%. Thus we received responses from 90 companies, 85 SMEs and 5 large companies. The 90 companies were interviewed using one questionnaire to ensure consistency in data on company's performance in the private market, participation in the tender market,

attitude concerning public procurements and suggestions to improve these procurements. The interviews were conducted using the Computer Aided Telephone Interview (CATI) method. For each company, we interviewed the head of the sales department and the head of the finance department. In addition we did five structured interviews with five distribution companies to explore their role regarding pharmaceutical PPMs.

Sample Reclassification

To improve the classification of companies according to their size, two additional variables that were taken from the survey data were added: namely number of employees and number of drugs produced. Then companies were clustered (regrouped) into two clusters (SMEs and Large) using fuzzy cluster analysis by the three variables: number of employees and number of produced drugs, in addition to 2012 turnover value. This regrouping reflects the best structure for our data. Fuzzy cluster analysis was used because of its lower sensitivity to outliers and better recognition of non-spherical clusters.

The fuzzy clustering algorithms are important in our case because they are suitable for situations dealing with overlapping clusters which include hybrid points situated in the midst of two disjointed compact clusters or bridges between clusters. This fits our data because the size of the company is recognized through three indicators.

The fuzzy algorithm used in this paper is FANNY, as described by Kaufman (1990). It depends on a collection of dissimilarities or distances between objects and does not need any representative points. The main advantage of this method is that its objective function does not depend on the squared distance. Hence, FANNY has lower sensitivity to outliers and a better recognition of non-spherical clusters. These two advantages make this method more robust than most clustering methods. FANNY aims to minimize the following objective function:

$$J = \sum_{L=1}^{C} \frac{\sum_{i=1}^{n}\sum_{k=1}^{n} u_{iL}^2 u_{kL}^2 d(x_i, x_k)}{2\sum_{k=1}^{n} u_{kL}^2}$$

Subject to

$u_{iL} \geq 0$ *for* $i=1,\ldots,n;\ L=1,\ldots,C$

$\sum_{L=1}^{C} u_{iL} = 1$ *for* $i=1,\ldots,n$

Where

n: number of observations

k: number of clusters

$d(x_i, x_k)$: represent the given distance between the two objects x_i and x_k.

u_{iL}: is the unknown membership degree of object x_i to cluster L,

Five companies shifted from the group of SMEs to the group of "Large" as a result of using three variables for classification instead of using only one variable.

Composite Indices and the Model Specification

Alpha Cronbach was calculated as a measure of reliability for the construction of the composite indexes. It is considered a coefficient of internal consistency. It provides a lower bound for the true reliability of the survey. Alpha Cronbach can be calculated according to the following formula:

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} \sigma_{ii}}{\sum_{i=1}^{K}\sum_{j=1}^{K} \sigma_{ij}}\right]$$

Where

K is the number of items (questions), and

σij is the estimated covariance between items i and j.

Table 10 shows the value for Alpha Cronbach values.

TABLE 10
Alpha Cronbach

Reliability Statistics		
Index	Alpha Cronbach	N of Items
Transparency index	0.7	4
Corruption index	0.63	7

Correlation and regression analyses were conducted to examine the relationship between the percentage of awarded bids and various

potential predictors. The Pearson correlation between the independent variables was low or insignificant, indicating the data are not affected by a serious collinearity problem. The analysis also tested the assumption of normality. For the selection bias in the regression model, correlations between the residual and the independent variables show no significant correlation. It is important to note that in regressing the percentage of awarded bids on characteristics for the companies that have a record of entering previous bids, the authors are not observing the equation for all the companies but just a portion of them (71 from total 90 companies). Hence, the results may tend to suffer from sample selection bias. To test this selection bias, the Heckman correction, a two-step statistical approach is applied (see Heckman (1979)).

According to the results of the Heckman selection test, the sample selection bias was not significant in this data set as the coefficient on lambda is not-statistically significant, and consequently OLS regression would seem appropriate in our case.