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Ownership structure and firm performance in the Egyptian manufacturing sector

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Abstract

We use the World Bank enterprise survey for the Egyptian manufacturing sector to study the correlation between the ownership structure (private vs. public, Egyptian vs. Arab foreign vs. non-Arab foreign) and firm performance, which we measure as sales per worker, capacity utilization, and net profit rate. Our main findings indicate that (1) productivity differences between Egyptian private and public firms are not significant, but firms with public ownership have a lower capacity utilization and a lower net profit rate than private firms, (2) firms with private Arab and private non-Arab foreign ownership are significantly more productive and have a higher capacity utilization than purely Egyptian owned firms, and (3) differences between Arab and non-Arab foreign ownership are not significant for productivity and capacity utilization, but firms with non-Arab foreign ownership have a higher net profit rate than firms with Arab foreign or Egyptian owners.

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1. Introduction

Firm performance is one of the driving forces for economic well-being and development in economies (Harrison and Rodríguez-Clare, 2010). Whereas determinants of firm performance in developed and large emerging economies have been studied empirically for decades, few empirical studies have been conducted for developing countries due to a lack of adequate microdata (Thompson, 2010). In order to overcome the data problem, the World Bank has conducted enterprise surveys around the world. The survey for firms from the Egyptian manufacturing sector is one of the most attractive data sets for empirical researchers. First, approximately one thousand firms are interviewed in each wave and this sample size is larger than for most other countries, especially developing countries in the Middle East and North Africa (MENA) and other African and Asian regions. Second, the World Bank has successfully conducted three waves (2004, 2007 and 2008) in Egypt instead of only one or two waves as for other countries, which is crucial when applying panel regression techniques such as fixed effects methods that exploit only the within variance over time. Moreover, Egypt is one of the largest economies in the MENA region.

In this paper, we focus on firms' ownership structure as an important determinant of firm performance (Maher and Andersson, 1999; Dewenter and Malatesta, 2001; Bellak, 2004), which we measure as sales per worker, capacity utilization, and net profit rate. The ownership structure is highly relevant from a practical perspective, because it can be influenced directly by national policies and international development programs. For example, public firms are often considered as less efficient than privately owned firms. The lack of empirical evidence in this research area has recently been criticized by the OECD (2013, p. 7): "State-owned enterprises (SOEs) constitute an integral feature of almost all economies in the Middle East and North Africa (MENA) region, and yet, unlike family-owned or listed companies, they have for the most part not been subject to systematic research, either in a regional or in a country-specific context." If privately owned firms would perform better than public firms, privatization of public firms should be considered. As public firms, in which the government is shareholder, have a large impact in the Egyptian economy, we can contribute to this stream of the literature by analyzing data from the World Bank enterprise survey for the Egyptian manufacturing sector. Our results indicate that productivity differences between Egyptian private and public firms are not significant, whereas firms with private ownership have a higher capacity utilization and a higher net profit rate than public firms.

Furthermore, the literature about foreign ownership has emphasized that foreign owned firms perform better than domestically owned firms. Because the World Bank enterprise survey for the Egyptian manufacturing sector contains not only information about private domestic and private foreign, but also about Arab and non-Arab foreign ownership, we can contribute to this stream of the literature by further distinguishing between the origins of foreign ownership. Foreign investments from Arab countries are highly relevant in many developing countries with an Islamic background in the MENA region as well as in many Asian countries. Our results indicate that firms with private Arab and private non-Arab foreign ownership are significantly more productive and have a higher capacity utilization than purely Egyptian owned firms. But the differences between Arab and non-Arab foreign ownership are not significant for productivity and capacity utilization. Firms with non-Arab foreign ownership have however a higher net profit rate than firms with Arab foreign or Egyptian owners.

The remainder of this paper is structured as followed. In the next section, we summarize the relevant literature, give some background information for Egypt, and derive our research hypotheses. The data set, variables, and econometric approach are described in Section 3. In Section 4, we present and discuss the results from our regression analyses. The paper concludes with a short summary and policy implications in Section 5.

2. Literature Review, Background Information, and Hypotheses

The ownership structure of a firm can be an important determinant of firm performance, which we measure as sales per worker, capacity utilization, and net profit rate, and is therefore often the target variable of economic policy measures.[1] For the case of Egypt, we focus on two dimensions of firm ownership: i) whether a firm is privately or publicly owned and ii) the nationality of the owner.[2]

It is well known that market failure is more likely to occur in developing countries than in developed countries (Stiglitz, 1989). State-owned enterprises (SOEs) are considered as a tool to address market failure (Megginson and Nettern, 2001). However, Shirley and Walsh (2000), using a variety of performance measures, examined 51 studies both for developing and industrialized countries from 1971 to 2000: Among 18 studies conducted for the developing countries, no evidence was found that public firms perform better than private ones. In Egypt, a significant number of politically connected military officers – mostly retired, but some in active service – sit on the directing boards of a wide range of state-owned public utilities (for more details see Sayigh, 2012). At the same time, public firms enjoy a preferential treatment from the government which may remediate productivity differences. For example, state-owned firms often have easier access to bank credit from the state-dominated banking system than have private firms (U.S. Department of State, 2014; Abdelkader, 2006; Fawzy and El-Megharbel, 2004).[3]

Prior to the privatization program, which began in 1991, the Egyptian economy was characterized by many sub-sectors in which economic activity was monopolized by public sector enterprises which were responsible for almost 55 percent of industrial production and controlled 80 percent of total export and import activities (Privatization Coordination Support Unit, 2002). In the context of a comprehensive economic reform program in Egypt during the 1990s, many SOEs were privatized in the hope of improving their poor management and weak capitalization (Omran, 2007). However, despite the efforts on privatization the share of SOEs in Egypt has remained among the largest within the region (Omran *et al.*, 2008). SOEs are generally expected to operate less efficiently and less profitable than privately owned enterprises due to the following reasons, summarized by Dewenter and Malatesta (2001). First, the pursuit of social and political objectives of SOEs may outweigh the maximization of profits (e.g., through employing

[1] Another variable of interest in this context, which has gained increased attention recently, is the survival of firms or their exit probability, respectively. For example, Mata and Portugal (2002) and Taymaz and Özler (2007) investigate the survival patterns of foreign and domestic firms in Portugal and Turkey, but do not find significant differences after controlling for other determinants. Ferragina *et al.* (2012) instead find foreign multinationals to be more likely to exit. For a comprehensive survey of this strand of literature see Wagner and Weche Gelübcke (2012).

[2] We do not consider other dimensions of ownership structure such as the concentration of shareholdings or the specific type of owner (e.g., family ownership).

[3] For a detailed discussion of reforms, governance, transparency, public policy outcomes etc. of state-owned enterprises in MENA countries see OECD (2012; 2013).

excess labor input or a preference for employing politically connected people instead of the best qualified). Second, the de facto nontransferability of SOE ownership leads to reduced incentives of monitoring the management. In line with theory, cross-country empirical studies on comparative performance differences between SOEs and privately owned enterprises find the latter to operate more efficiently and more profitable ceteris paribus (e.g., Boardman and Vining, 1989; Dewenter and Malatesta, 2001). Looking at SOEs that become privatized, Dewenter and Malatesta (2001) find however little evidence that the privatization itself increases firm performance, since improvements start around three years before the change of ownership. They conclude that rather "the political impetus behind privatization first impels government firms to operate more profitably" (Dewenter and Malatesta, 2001: p. 334). Omran (2007) presents evidence on the post-privatization firm performance in Egypt. He finds firm performance, such as profitability and operating efficiency, increasing for enterprises that were privatized between 1994 and 1998. We derive our first hypothesis regarding the performance link of public and private ownership accordingly:

> *Hypothesis 1: Firms with private ownership are more productive, have higher capacity utilization, and have a higher profit rate than firms with public ownership.*

The second dimension of ownership structure refers to the nationality of the owner. Although there was a deadlock of foreign direct investments (FDI) inflows following the 2011 revolution, Egypt represents the most attractive destination for foreign investors in the region due to its large population and cheap labor costs with a stock of USD 85046 million in 2013 and inflows of USD 5553 (9495) million in 2013 (2008) (UNCTAD, 2014: p. 38, Annex Table 1 and 2). Even though the Egyptian government has several schemes to attract FDI, there are significant obstacles for foreign investors. For example, labor rules prohibit a non-Egyptian workforce of more than ten percent in most sectors, importing for trading purposes is permitted only through a wholly Egyptian owned firm, and there is a lack of intellectual property rights protection. Other hurdles are excessive bureaucracy and the fact that the judicial system may be subject to political influence (U.S. Department of State, 2014).

FDI and foreign owned firms or foreign multinational enterprises (MNEs)[4] are an important channel, especially for developing economies, to raise overall industry performance through compositional effects as well as the performance of indigenous firms at the micro level through positive externalities. For example, positive technology and productivity spillovers can occur if indigenous producers learn from the demonstration of superior technology of foreign competitors, if they establish backward or forward linkages with foreign MNEs, or if they benefit from knowledge of employees that were formerly working for foreign MNEs (see Görg and Greenaway, 2004, for a detailed discussion and a survey of the empirical evidence). An inevitable precondition for such positive spillovers is some kind of superiority in terms of applied technology or productivity in general. Standard MNE theory suggests a specific competitive advantage of multinationals, such as a superior production technology, organizational superiority or an established brand that is available within all company affiliates at low marginal costs due to its public good character (e.g., Dunning, 1988; Caves, 1996). This competitive advantage has either been the initial reason for the international expansion of the firm or may stem from the multinationality of the firm itself due to better access to input and output markets or the

[4] We use the terms *foreign multinationals* and *foreign owned firms* interchangeably.

flexibility of shifting activities across borders (Casson, 1987). This specific advantage of MNEs over non-MNEs is assumed to outweigh the extra costs these firms have to bear when operating in foreign markets. This "liability of foreignness" has been described by Hymer (1977) and is due to, for example, communication and transport barriers, higher search costs in factor markets, product adaption, and monitoring problems due to spatial distance.

The theory of specific competitive advantages mainly finds support in a huge strand of literature on the foreign ownership performance premium. Foreign owned firms turn out to enjoy a robust predominant performance in terms of a broad set of measures across developed and developing countries. This foreign ownership performance premium regularly loses significance if foreign multinationals are compared to only domestic multinationals pointing to multinationality as the driving factor instead of foreignness (for an overview of the literature see Bellak, 2004). Empirical evidence is mainly available for developed countries because of better data availability but studies for developing and emerging economies nevertheless exist, for example, for India (Chibber and Majumdar, 1999; Rasiah and Kumar, 2008; Keshari, 2013), Mexico (Khawar, 2003), Indonesia (Takii and Ramstetter, 2005, Arnold and Javorcik, 2009), Turkey (Yasar and Paul, 2007), Brazil (Willmore, 1986), Kenya (Rasiah and Gachino, 2005), Venezuela (Aitken and Harrison, 1999), Ghana (Aryeetey *et al.*, 2008; Waldkirch and Ofosu, 2010), and nineteen sub-Saharan African countries (Foster-McGregor *et al.*, 2014). To the best of the authors' knowledge, Omran *et al.* (2008) is the only econometric study which investigates the foreign ownership performance premium in Egypt.[5] In contrast to the vast majority of developing economy studies, they find no significant role of foreign ownership on firm performance, in their case measured as return on assets and return on equity of listed companies. They also consider public ownership in their analysis and conclude with a positive role of concentrated government ownership on the return on equity. However, although the authors' claim to use representative data, the number of Egyptian firms used for their analysis is only 81 (45 of which are operating in the manufacturing sector). Notwithstanding the empirical evidence we follow the theory in stating our second hypothesis as:

> *Hypothesis 2: Firms with foreign (including Arab) ownership are more productive, have higher capacity utilization, and have a higher profit rate than domestically (Egyptian) owned firms.*

Another step in our analysis is to split the group of foreign owned firms into those with Arab ownership and non-Arab foreign ownership to account for specific cultural and institutional differences between these groups. Although MNEs may have lost most of their country of origin imprint, their home country may still matter due to differences in management culture (Ferner, 1997), differences in national business systems (Whitley, 1992), differences in factor endowments, or overall cultural variations. The specific differences between Arab and non-Arab investors are of special interest in our context. An important aspect that differentiates between the characteristics of Arabs and non-Arabs is the culture, which can shape peoples' behavior and preferences via religious norms and identity (Akerlof, 2007). For example, in the famous Hofstede dimensions of culture (e.g., Hofstede, 1980; Hofstede, 2011; http://geert-hofstede.com), Arab countries show usually higher levels of power distance and uncertainty avoidance, but

[5] Other studies consider the entire Middle East and North Africa (MENA) region and look at other than efficiency variables (such as productivity and profitability). For example, Fakih and Ghazalian (2013) look at the exporting behaviour and its determinants and report export increasing effects of private foreign ownership also for Egypt separately.

lower levels of individualism, masculinity, and pragmatism than Western countries. Furthermore, Arab countries' business systems and economic institutions are shaped by principles of the sharia. The system of Islamic economics is characterized mainly by three aspects: i) a set of behavioral norms, such as that men are required to "be content with 'normal' profits […] [and] that he must not engage in speculation and monopolization, or make deals, like insurance contracts, that allegedly involve gambling, uncertainty, and exploration" (Kuran, 1986: p. 136). Two further aspects are ii) the prohibition of interest and iii) a special tax on agriculture and mining products (zakat) (ibid.). In particular the first two aspects lead us to our third hypothesis:

> *Hypothesis 3: Firms with non-Arab foreign ownership have a higher profit rate than firms with Arab ownership.*

3. Data and Econometric Approach

We use the World Bank enterprise survey for the Egyptian manufacturing sector for the survey years 2004, 2007, and 2008 or financial years 2003, 2006, and 2007, respectively. The survey is carried out in an unbalanced panel design at the establishment level. All establishments in the data employ more than 5 workers. The World Bank enterprise surveys collect data from key manufacturing and service sectors in different regions all over the world.[6] These surveys provide important information such as sales and supplies, investment climate constraints, capacity utilization, profits, infrastructure and services, finance, legal environment, and business-government relations.

In order to study the correlation between ownership structure and firm performance, we use several specifications and regression techniques. The dependent variables are either the log of sales per worker (SALES), the capacity utilization (CAPACITY) or the net profit rate (PROFIT). SALES is the log of total sales in a financial year (Egyptian pound value of all sales including manufactured goods and goods the establishment has bought for trading) divided by the average number of all workers employed in that year. The log of sales per worker is a crude measure for productivity and often used in the literature. For SALES, we estimate linear regression models with ordinary least squares (OLS). CAPACITY is the average capacity utilization in a financial year measured in percent, which describes the amount of output actually produced relative to the maximum amount that could be produced with the existing machinery and equipment and regular shifts. Thus, CAPACITY can be broadly associated with efficiency. For CAPACITY, we estimate linear regression models with OLS as well as Tobit models that account for potential censoring of capacity utilization at 0 percent and 100 percent. PROFIT is the net profit rate in a financial year measured in percent, which is net profits (after tax) over the establishment's total annual sales. For PROFIT, we estimate also linear regression models with OLS for firms with at least zero net profits as well as Tobit models that account for the fact that about 10 percent of all firms report to have no net profits, which can be reasoned by making net losses or by being a non for profit firm. In order to account for unobserved time invariant firm heterogeneity, we exploit

[6] See www.enterprisesurveys.org for a detailed description of the data and the methodology used for data collection as well as the online data access. Also note that we concentrate on the manufacturing sector, because information about capacity utilization is only available for the manufacturing sector. Moreover, the data for 2004 is taken from the Productivity and the Investment Climate Private Enterprise Survey available for the manufacturing sector.

the panel nature of the data set. Whereas it is simple to include firm specific fixed effects in the above OLS models, we can only estimate random effects Tobit models. Note however that the panel estimates serve only as a robustness check, because identification stems from within variation which is typically low in the context of firm ownership and in our short unbalanced panel data.

We use two specifications for our explanatory variables of interest that describe the ownership structure of a firm. The first specification includes three dummy variables. The three dummy variables take the value one if the firm is at least partly owned by private Arab foreign investors, by private non-Arab foreign investors, or by the government which relates to public ownership. The reference group is private Egyptian ownership. Multiple ownership is of course possible but does not occur often in our data. For example, most firms have either joint private Egyptian with Arab or joint private Egyptian with non-Arab foreign ownership, whereas joint Arab and non-Arab foreign ownership is seldom. Arab as well as non-Arab foreign ownership occurs as minority and as majority shareholder. Moreover, a combination between private and public ownership is seldom, as most public firms are entirely owned by the government. In our second specification, we use the shares of Arab, non-Arab foreign and public ownership in percent instead of the dummy variables. Reference group is again private Egyptian ownership. The estimated coefficients for the ownership variables then indicate in how far firm performance differs between different ownership structures.

Further explanatory variables are included in the regressions in order to control for differences between firms and within firms over time. As these variables fulfill only the purpose of control variables in this research note, they are not further discussed and only described in Table I, in which also descriptive statistics for our variables of interest can be found. Note that the number of observations slightly differs between the three samples for the firm performance measures SALES, CAPACITY, and PROFIT due to differences in the number of missing values in these three dependent variables. In the SALES sample, the number of observations is 2891 from 1583 firms. In the CAPACITY sample, the number of observations is 2953 from 1605 firms. The PROFIT sample is further restricted to firms with at least zero net profit rates, which results in 2379 observations from 1416 firms. More than three percent of the firms in our samples are at least partly owned by Arab foreign investors, another three percent by non-Arab foreign investors, and another three percent by the government which relates to public ownership. The mean owner share for each ownership group in the samples is roughly more than two percent. Average sales per capita is approximately 10.44 log points (or 35000 Egyptian pounds). The average capacity utilization is 66.49 percent. The net profit rate for firms with at least zero net profits is on average 13.55 percent.

Table I: Descriptive statistics for all variables

	SALES sample (n=2891, N=1583)		CAPACITY sample (n=2953, N=1605)		PROFIT sample (n=2379, N=1416)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Dependent variables						
SALES: log total sales per worker (Egyptian pounds)	10.4434	1.6283				
CAPACITY: capacity utilization (%)			66.4883	22.7879		
PROFIT: net profit rate (%)					13.5472	12.4049
Explanatory variables of interest:						
Owner any private Arab foreign (dummy)	0.0346	0.1828	0.0339	0.1809	0.0366	0.1877
Owner any private non-Arab foreign (dummy)	0.0315	0.1746	0.0315	0.1747	0.0324	0.1770
Owner any public (dummy)	0.0339	0.1810	0.0342	0.1818	0.0277	0.1643
Owner share private Arab foreign (%)	2.0079	12.4405	1.9658	12.3125	2.1622	12.9385
Owner share private non-Arab foreign (%)	2.0369	12.7658	2.0212	12.6836	2.0456	12.7568
Owner share public (%)	2.7177	15.6353	2.7097	15.5520	2.1615	13.8464
Control variables:						
Exporter (dummy)	0.2567	0.4369	0.2547	0.4357	0.2673	0.4427
Top manager with university degree (dummy)	0.7738	0.4185	0.7704	0.4206	0.7810	0.4137
Top manager job experience (years)	14.1377	12.0454	14.1019	12.0309	14.2182	11.9312
Employment share primary schooling (%)	11.6904	15.6469	11.7345	15.6882	11.5453	15.2749
Employment share preparatory schooling (%)	17.8543	17.6595	17.7722	17.6718	17.8217	17.3824
Employment share secondary schooling (%)	38.5906	22.7764	38.6187	22.8666	39.0560	22.7457
Employment share university schooling (%)	17.0362	14.7924	17.0908	14.8916	17.1438	14.7790
Employment share female workers (%)	16.5181	21.8635	16.6610	22.0077	16.9468	21.9441
Employment share temporary workers (%)	7.0172	13.5237	7.0198	13.4885	7.0395	13.4077
Average number of all workers	224.3065	693.1781	225.1879	692.9547	200.7919	575.8121
Average number of all workers ^2, Average number of all workers ^3						
At least one unionized worker (dummy)	0.2318	0.4220	0.2313	0.4217	0.2295	0.4206
Training for workers (dummy)	0.1809	0.3850	0.1825	0.3863	0.1803	0.3845
Firm age (years)	22.3964	16.8248	22.3854	16.8735	21.8840	16.4336
Firm has other branches (dummy)	0.2165	0.4120	0.2171	0.4123	0.2261	0.4184
Firm has R&D department (dummy)	0.2138	0.4100	0.2144	0.4104	0.2194	0.4139
Financial year 2006 (dummy)	0.3272	0.4693	0.3251	0.4685	0.3380	0.4731
Financial year 2007 (dummy)	0.3663	0.4819	0.3695	0.4827	0.3640	0.4813

9 sectors of main activities (dummies): garments, textiles, machinery & equipments, chemicals, electronics, metal, non metal, agro, other.
23 regional governorates (dummies): Cairo, Alexandria, Port Said, Suez, Damietta, Dakahliya, Sharkiya, Qualyubia, Kafr-El-Sheikh, Gharbiya, Menoufiya, Beheira, Ismailia, Giza, Bani-Suef, Fayoum, Minya, Assuit, Souhag, Qena, Aswan, Loxur, South Saini.

Data source: World Bank enterprise survey, Egypt, 2004/07/08.

4. Estimation Results

Table II presents our regression results for ownership structure and log sales per worker as proxy for productivity.[7] The pooled OLS results for the complete estimation sample in column (1) indicate that firms with any Arab or non-Arab foreign owners have on average more than 0.6 log points or more than 80 percent higher sales per capita than purely Egyptian owned firms – private and public firms. The second specification with owner shares indicates that firms, which have one percentage point more Arab or non-Arab foreign owners, have on average more than 0.008 log points or nearly one percent higher sales per capita. Differences between private and public Egyptian ownership are not statistically significant.

Table II: Estimation results for log sales per worker (SALES)

	(1) OLS	(2) OLS	(3) OLS-FE
Specification with dummies:			
Owner any private Arab foreign (dummy)	0.6496***	0.6176***	0.6929**
	(0.1418)	(0.1916)	(0.2745)
	[0.0000]	[0.0013]	[0.0117]
Owner any private non-Arab foreign (dummy)	0.6185***	0.6641***	0.3811
	(0.1579)	(0.1804)	(0.2744)
	[0.0001]	[0.0003]	[0.1651]
Owner any public (dummy)	-0.1036	-0.0575	-0.3683
	(0.2201)	(0.2576)	(0.3879)
	[0.6379]	[0.8234]	[0.3426]
R^2 (within R^2 for FE)	0.1910	0.1976	0.1227
Number observations	2891	929	2891
Number firms	1583	666	1583
Specification with shares:			
Owner share private Arab foreign (%)	0.0093***	0.0089***	0.0121***
	(0.0022)	(0.0028)	(0.0044)
	[0.0000]	[0.0015]	[0.0056]
Owner share private non-Arab foreign (%)	0.0083***	0.0084***	0.0035
	(0.0023)	(0.0025)	(0.0034)
	[0.0004]	[0.0008]	[0.3014]
Owner share public (%)	-0.0011	-0.0009	-0.0024
	(0.0022)	(0.0026)	(0.0039)
	[0.6178]	[0.7202]	[0.5332]
R^2 (within R^2 for FE)	0.1898	0.1938	0.1237
Number observations	2891	929	2891
Number firms	1583	666	1583

Notes: Sample includes all firms with more than 5 workers in columns (1) and (3) and with more than 100 workers in column (2). Dependent variable is log of total sales per worker. Reference group for ownership is private Egyptian. All regressions include control variables as listed in Table I. Column (3) includes additionally firm fixed effects. OLS regressions with robust standard errors clustered at firm level in parentheses and p-values in brackets. Statistically significant at * p<0.10, ** p<0.05, or *** p<0.01.
Data source: World Bank enterprise survey, Egypt, 2004/07/08.

[7] We only present and discuss the results for our variables of interest, i.e., the ownership structure. The complete estimation results can be requested from the corresponding author.

In column (2), we conduct a robustness check with respect to firm size. As small firms have relatively seldom foreign or public owners, we re-estimate the pooled OLS regressions for a sample of firms with at least 100 workers. The results do not change noteworthy. Our next robustness check is concerned with unobserved time invariant heterogeneity between firms. In column (3), we present results for fixed effects OLS regressions. The results support the significant positive correlation between productivity and Arab ownership and the non significant differences between private and public Egyptian ownership. The coefficients for private non-Arab foreign ownership are however smaller and standard errors are larger than in the pooled OLS regressions so that the coefficients are not statistically significant at conventional levels anymore. Note however that the fixed effects regressions suffer from the low within variance of the ownership variables and the short panel length.

The estimation results for ownership structure and capacity utilization in percent as proxy for the efficient use of resources are presented in Table III. The pooled OLS results for the complete estimation sample in column (1) indicate that firms with any Arab or non-Arab foreign owners have on average an approximately four percentage points higher capacity utilization than purely Egyptian owned firms. Firms with any public Egyptian ownership have on average an approximately three percentage points lower capacity utilization than firms with only private Egyptian owners. The difference is however only statistically significant at the 21 percent level. When looking at the pooled OLS regressions for larger firms with at least 100 workers in column (2), the coefficient for any private Arab ownership is not significant anymore, whereas the coefficients for any private foreign and public Egyptian ownership are larger in size and statistically significant at higher levels than in the estimates for the complete sample in column (1). In the fixed effects OLS regression in column (3), which suffer again from low status changes in ownership and short panel length, only the lower capacity utilization (by approximately eleven percentage points) for firms with public ownership remains significant.

As already discussed in Section 3, we also estimate random effects Tobit models that account for potential censoring of capacity utilization. The estimated coefficients are presented in column (4). We have further computed and present the marginal effects for the intensive margin, i.e., for the expected capacity utilization conditional on reporting a capacity utilization larger 0 percent and smaller 100 percent (McDonald and Moffitt, 1980), for an average firm with purely private Egyptian ownership as reference firm and under the assumption that the mean random effect is zero. Firms with any Arab foreign owners have on average an approximately three percentage points higher capacity utilization than purely private Egyptian firms, which is statistically significant at 13 percent. Firms with any non-Arab foreign owners have on average an approximately four percentage points higher capacity utilization than purely private Egyptian firms, which is statistically significant at 4 percent. Firms with any public Egyptian ownership have on average an approximately 3.4 percentage points lower capacity utilization than firms with only private Egyptian owners, which is statistically significant at 9 percent.

The regression results for the second specification with owner shares in Table III support the general findings from the first specification that firms with private Arab and non-Arab foreign owners have a higher capacity utilization than private Egyptian firms and that firms with public ownership have a lower capacity utilization. A one percentage point higher share in Arab ownership is in all estimated models correlated with about 0.05 to 0.06 percentage points higher capacity utilization – except for the sample with only large firms in column (2). A one percentage

point higher share in non-Arab foreign ownership is in all estimated models correlated with about 0.04 to 0.05 percentage points higher capacity utilization – except for the fixed effects OLS regression in column (3). A one percentage point higher share in public ownership is in all estimated models correlated with about 0.06 to 0.18 percentage points lower capacity utilization.

Table III: Estimation results for capacity utilization in percent (CAPACITY)

	(1) OLS	(2) OLS	(3) OLS-FE	(4) Tobit-RE	(4) mfx
Specification with dummies:					
Owner any private Arab foreign (dummy)	3.6119*	1.2310	2.6256	3.8373	2.7717
	(2.1445)	(2.3147)	(3.1394)	(2.5004)	(1.8109)
	[0.0923]	[0.5950]	[0.4031]	[0.1249]	[0.1259]
Owner any private non-Arab foreign (dummy)	4.2136*	4.5581*	3.5596	5.4444**	3.9326**
	(2.3328)	(2.3761)	(4.7610)	(2.6809)	(1.9438)
	[0.0711]	[0.0555]	[0.4548]	[0.0423]	[0.0431]
Owner any public (dummy)	-3.3993	-4.4477	-11.1398**	-4.7474*	-3.4292*
	(2.7170)	(2.7510)	(4.5961)	(2.7830)	(2.0071)
	[0.2111]	[0.1064]	[0.0155]	[0.0880]	[0.0875]
R^2 (within R^2 for FE)	0.1603	0.1181	0.0692		
Number observations	2953	947	2953	2953	
Number firms	1605	677	1605	1605	
Specification with shares:					
Owner share private Arab foreign (%)	0.0587**	0.0146	0.0476	0.0665*	0.0480*
	(0.0277)	(0.0326)	(0.0352)	(0.0366)	(0.0265)
	[0.0341]	[0.6538]	[0.1772]	[0.0689]	[0.0698]
Owner share private non-Arab foreign (%)	0.0471	0.0521	0.0082	0.0598	0.0431
	(0.0320)	(0.0321)	(0.0613)	(0.0367)	(0.0265)
	[0.1414]	[0.1047]	[0.8935]	[0.1030]	[0.1039]
Owner share public (%)	-0.0635*	-0.0824**	-0.1811***	-0.0861***	-0.0621***
	(0.0344)	(0.0350)	(0.0580)	(0.0322)	(0.0232)
	[0.0650]	[0.0190]	[0.0018]	[0.0076]	[0.0075]
R^2 (within R^2 for FE)	0.1610	0.1214	0.0730		
Number observations	2953	947	2953	2953	
Number firms	1605	677	1605	1605	

Notes: Sample includes all firms with more than 5 workers in columns (1), (3) and (4) and with more than 100 workers in column (2). Dependent variable is capacity utilization in percent. Reference group for ownership is private Egyptian. All regressions include control variables as listed in Table I. Column (3) includes additional firm fixed effects and column (4) random effects. OLS regressions in columns (1), (2), and (3) and random effects ML-Tobit regressions in column (4) with censoring levels at 0 and 100 percent capacity utilization. Marginal effects for the intensive margin in Tobit regressions are computed for an average firm with private Egyptian ownership and the assumption of a mean random effects of zero. Robust standard errors clustered at firm level in parentheses and p-values in brackets. Statistically significant at * p<0.10, ** p<0.05, or *** p<0.01.
Data source: World Bank enterprise survey, Egypt, 2004/07/08.

Table IV presents our regression results for ownership structure and the net profit rate in percent. Arab foreign ownership is in all estimated models neither in the specification with dummies nor in the specification with shares significantly correlated with the profit rate. If anything, firms with private Arab foreign ownership have a lower profit rate than firms with private Egyptian ownership. Firms with non-Arab foreign private ownership seem however to have a three to four percentage points higher profit rate than firms with private Egyptian or Arab ownership in the specification with dummies. A one percentage point higher share in non-Arab

foreign private ownership is also correlated with approximately 0.03 to 0.05 percentage points higher profit rates in the specification with shares. Although not statistically significant in all models, the estimation results further indicate that firms with public ownership have a lower net profit rate than firms with purely Egyptian private ownership. In the specifications with dummies, the profit rate for firms with public ownership is approximately one to three percentage points lower. In the specifications with shares, a one percentage point higher share in public ownership is correlated with approximately 0.02 to 0.05 percentage points lower profit rates.

Table IV: Estimation results for net profit rate in percent (PROFIT)

	(1) OLS	(2) OLS	(3) OLS-FE	(4) Tobit-RE	(4) mfx
Specification with dummies:					
Owner any private Arab foreign (dummy)	-0.6288	1.5617	-1.7423	-1.4687	-0.9008
	(1.7704)	(2.5615)	(1.7542)	(1.3869)	(0.8523)
	[0.7225]	[0.5423]	[0.3208]	[0.2896]	[0.2906]
Owner any private non-Arab foreign (dummy)	4.3378*	3.5242	3.0667	4.7316***	2.9021***
	(2.2121)	(2.4326)	(2.4489)	(1.5371)	(0.9381)
	[0.0501]	[0.1480]	[0.2107]	[0.0021]	[0.0020]
Owner any public (dummy)	-1.2555	-3.4634*	-1.7237	-3.3743**	-2.0696**
	(1.8584)	(2.1004)	(3.8309)	(1.6698)	(1.0288)
	[0.4994]	[0.0997]	[0.6528]	[0.0433]	[0.0443]
R^2 (within R^2 for FE)	0.1007	0.1533	0.0828		
Number observations	2379	759	2379	2660	
Number firms	1416	574	1416	1499	
Specification with shares:					
Owner share private Arab foreign (%)	-0.0135	0.0217	-0.0294	-0.0247	-0.0152
	(0.0251)	(0.0450)	(0.0229)	(0.0201)	(0.0124)
	[0.5920]	[0.6303]	[0.1994]	[0.2191]	[0.2201]
Owner share private non-Arab foreign (%)	0.0490*	0.0491	0.0528	0.0509**	0.0313**
	(0.0280)	(0.0316)	(0.0346)	(0.0211)	(0.0129)
	[0.0811]	[0.1210]	[0.1270]	[0.0157]	[0.0153]
Owner share public (%)	-0.0162	-0.0484*	-0.0318	-0.0426**	-0.0262**
	(0.0232)	(0.0247)	(0.0394)	(0.0194)	(0.0120)
	[0.4847]	[0.0507]	[0.4202]	[0.0280]	[0.0287]
R^2 (within R^2 for FE)	0.0997	0.1535	0.0841		
Number observations	2379	759	2379	2660	
Number firms	1416	574	1416	1499	

Notes: Sample includes firms with more than 5 workers in columns (1), (3) and (4) and with more than 100 workers in column (2). Samples for OLS regressions in columns (1), (2) and (3) are further restricted to firms with at least zero net profits. Dependent variable is the net profit rate in percent. Reference group for ownership is private Egyptian. All regressions include control variables as listed in Table I. Column (3) includes additional firm fixed effects and column (4) random effects. OLS regressions in columns (1), (2), and (3) and random effects ML-Tobit regressions in column (4) with a censoring level below zero net profits. Marginal effects for intensive margin in Tobit regressions are computed for an average firm with private Egyptian ownership and the assumption of a mean random effects of zero. Robust standard errors clustered at firm level in parentheses and p-values in brackets. Statistically significant at * p<0.10, ** p<0.05, or *** p<0.01.
Data source: World Bank enterprise survey, Egypt, 2004/07/08.

5. Conclusion

Our estimation results indicate that productivity differences between Egyptian private and public firms are not significant. But firms with public ownership have a lower capacity utilization and a lower net profit rate. The lower capacity utilization and net profit rate may point to inefficiencies in the public sector as suggested by theory and consequently is in line with our first research hypothesis. Even though we do not find productivity differences between private and public firms, the lower capacity utilization and lower profit rates of public firms suggest that privatization should be fostered. Omran (2007) underlines this conclusion in finding firm-level performance improvements following privatization.

Moreover, firms with private Arab and private non-Arab foreign ownership are significantly more productive and have a higher capacity utilization than purely Egyptian owned firms, which lends support to our second hypothesis. This superiority of foreign owned firms is in line with traditional MNE theory, suggesting that multinationals are endowed with specific competitive advantages, such as more up-to-date technology and/or a better management. Thus, our findings support that it is generally advantageous to attract FDI to improve aggregate industry performance and enable domestic firms to benefit from spillovers. An open question is to what extent not only private but also public firms may benefit from inward FDI. For example Girma and Gong (2008) provide rather pessimistic evidence in this context by finding that state-owned firms in China have not much profited from increasing inward FDI. In this context, it needs however to be mentioned that the World Bank data set does not allow us to distinguish between foreign multinationals and Egyptian multinationals. Therefore, we are methodologically not able to isolate the role of a firm's foreign ownership from multinationality. However, most Egyptian owned firms only serve the domestic market and there are only very few Egyptian owned multinationals. In fact, only two Egyptian firms are responsible for most of all outward FDI flows, namely Orascom Telecom and Oriental Weavers For Carpets (Bonaglia and Goldstein, 2006).

We could not find significant differences between Arab and non-Arab foreign ownership for productivity and capacity utilization so that the source of FDI does not seem to matter that much for these dimensions. But our estimation results indicate that firms with non-Arab foreign private ownership have a higher net profit rate than firms with private Arab or private Egyptian owners. This finding lends support to our third hypothesis that cultural and institutional differences between Arab and non-Arab investors can play a significant role as a determinant for firm performance with respect to profitability and, consequently, might negatively affect the attraction of FDI from non-Arab investors in Arab countries.

When it comes to the causality of our results, caution is called for due to a possible selection bias. On the one hand, it may be the case that above-average performing Egyptian firms were preferably privatized or acquired by foreign investors ("cherry picking"), leading to a positive correlation of private or foreign ownership with firm performance, without however being the root cause. On the other hand, it may also be the case that below-average performing Egyptian firms were preferably privatized or acquired by foreign investors ("lemon grabbing"), leading to a negative correlation with firm performance (Weche Gelübcke, 2013).

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