

Foreign Ownership and Financial Performance: Evidence from Egypt

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ABSTRACT

With the use of a panel of 8,185 companies in Egypt for the period 2006-2010, we examine the relationship between the degree of foreign ownership and financial performance. The results show that foreign ownership is positively associated with firm's return on assets (ROA), return on equity (ROE) and debt ratio (DR). When comparing the effect of various degrees of foreign ownership on financial performance, we find that foreign ownership increases financial performance up to a level and then declines. Our findings indicate that the effect of foreign ownership is sector-specific.

JEL Classifications: C2, G32

Keywords: foreign ownership; financial performance; Egypt

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I. INTRODUCTION

The Egyptian Revolution in January 2011, which put an end to the thirty-year old regime of President Mubarak, has led to an overall condemnation of many of the economic policies and procedures of that period. Among the procedures that have been criticized are the numerous initiatives to encourage foreign ownership that include equal treatment for foreigners and domestic investors in terms of land and capital ownership, tax holidays for at least five years for foreign investors, and the exemption of some labor law articles for foreign firms operating in Free Zones.

From a macroeconomic perspective these policies have contributed to an increase in foreign ownership and an upsurge in Foreign Direct Investment (FDI) in Egypt, which is reflected in a rise of inward FDI from \$38,925 million in 2006 to \$73,095 million in 2010. In 2010, Egypt was ranked number 14 out of 116 developing economies, in attracting inward FDI (UNCTAD). The positive effect of foreign ownership is attributed to the ability of foreign-owned firms to increase capital, transfer technology and R&D, and improve managerial skills. However foreign ownership can also have a negative impact on the economy, when it is accompanied by "crowding out" of local companies, increased unemployment among local workers, and lower tax revenues due to tax holidays given to foreign firms.

There is a current debate in Egypt about the importance of foreign ownership in the Egyptian economy. While a group is stressing the importance of policies to increase foreign ownership as a means of improving financial performance of firms in Egypt and to achieve higher GDP growth rates, another group is rejecting these policies based on the perception that the financial performance of foreign ownership is not very different from domestic ownership. The second group is particularly found among Egyptian Labor Unions and Egyptian workers, who have been a main participant in the revolution because they lost their jobs due to privatization and foreign ownership.

The same debate has also been an issue of interest in the academic literature. The underpinnings of this topic are found in several theories, namely the agency theory, the resource-based theory and the institutional theory (Douma et al., 2006). The theories focus on explaining the link between ownership and financial performance in the context of developed countries and not necessarily the emerging and less developed countries. Bhagwati and Brecher (1980), Brecher and Bhagwati (1981) cogently deal with foreign ownership, trade and welfare, and they show that foreign ownership increases national welfare and national income of the host country. When at the national level the welfare and income increase, it is easy to recognize that at the corporate level everything is along the line. It is, however, not clear of the trajectory of the growth of welfare and corporate earnings, earning per share (EPS), and other issues. Foreign ownership with a domestic firm is like a merger of two firms, domestic and foreign. It is easy to prove that if this merger is done under fair deal, EPS increases if the domestic firm's price earnings ratio $(P/E)_d$ exceeds the foreign firm's $(P/E)_F$. Ghosh, and Ghosh (1997) show, through their triangle, the optimum location, and optimum investment that involve pairing up firms' joint action. It is illustrated that paring of two or more firms – local and foreign – can make the joint ventures earnings-augmenting. Capital and skills can be extensive, synergy escalates, and that undoubtedly becomes beneficial for every entity involved. Norman and Jones (1979)

convey the same result through a model of trade and unemployment in a context of general equilibrium.

In a different twist, in the context of determining optimum capital structure, - particularly with reference to a search of pecking order as a dynamic leverage theory, Bagley and Yaari (1996), and Bagley, Ghosh, and Yaari (1998) present a class of diffusion models that mimic this behavior in a stochastically dynamic framework and show how to optimize a financing strategy by any static trade-off theory as input. It should be noted that Fischer, Heinkel, and Zechner (1989), and Mauer and Triantis (1994) have provided the dynamic leverage policy which is different from Bagley, and Yaari (1996), and Bagley, Ghosh, and Yaari (1998). Making use of Arrow, Karlin, and Scarf's (1958), and particularly, Arrow-Harris-Marschak dynamic model (Section III, 1958) and their (S, s) policy, we build the stochastic model of Weiner process with constant drift (μ) and diffusion parameter (σ) as follows:

$$dL = \mu dt + \sigma d\omega \quad (1)$$

where L is the state-control variable representing leverage index that is monotonically increasing with debt and decreasing with equity. We postulate endogenous barriers with asymmetric quadratic penalty function, symmetric transaction costs and no drift, one can get the expressions for $s(L)$, $S(L)$, $u(L)$, $\lambda(L)$, $m(L)$, $v(L)$, $g(L)$, and $\omega(L)$. It is postulated that L triggers a fixed transaction cost at each encounter with upper and lower barriers, as in (S, s), and generates an instantaneous penalty when on free traversal between barriers. The barrier points and the return point chosen to minimize expected total periodic cost are $L = \beta$ (upper barrier point) when the firm makes costly lump-sum readjustment in its debt equity position to the point, $L = r$, and issues stock and retires bonds in the amount of $\beta - r$. If the leverage index hits the lower barrier, $L = \alpha$, there will be readjustment back to $L = r$ by stock repurchase bankrolled by borrowing in the amount of $r - \alpha$.

The paradigm with endogenous barriers, symmetric quadratic penalty and transaction costs and no drift can be brought out as:

$$s(L) = e^{-\int \frac{2\mu(L)}{\sigma^2(L)} dL} = e^0 = 1 \quad (2)$$

and the scale function, $S(L)$ is

$$S(L) = \int s(L) dL = L \quad (3)$$

The probability of hitting the upper barrier before lower barrier, $u(L)$, given that the process begins at an unspecified leverage, L is as follows:

$$u(L) = \frac{S(L) - S(\alpha)}{S(\beta) - S(\alpha)} = \frac{L - \alpha}{\beta - \alpha} \quad (4)$$

And the speed density, $m(L)$, computed from (3), is

$$m(L) = \frac{1}{\sigma^2 s(L)} = \frac{1}{\sigma^2} \quad (5)$$

From this value one can get the expected time to reach either barrier from any point L is $v(L)$, by use of expressions (3) – (5), and here then

$$\begin{aligned} v(L) &= 2u(L) \int_L^\beta (S(\beta) - S(\xi)) \lambda(\xi) d\xi + 2(1 - u(L)) \int_\alpha^L (S(\xi) - S(\alpha)) \lambda(\xi) d\xi \\ &= \frac{(L - \alpha)(\beta - L)}{\sigma^2} \end{aligned} \quad (6)$$

Assuming penalty function, $g(L)$, centered on the ideal leverage, L_0 , where

$$g(L) = q(L - L_0) \quad q > 0 \quad (7)$$

whose lowest value is $g(L_0) = 0$ measures the instantaneous penalty incurred by any deviation from the ideal leverage, L_0 . However, the expected penalty incurred up to the first encounter with either barrier, $\omega(L)$, when starting from any point L is

$$\begin{aligned} \omega(L) &= 2u(L) \int_L^\beta (S(\beta) - S(\xi)) \lambda(\xi) \rho(\xi) d\xi + 2(1 - u(L)) \int_\alpha^L (S(\xi) - S(\alpha)) \lambda(\xi) \rho(\xi) d\xi \\ &= \frac{q(L - \alpha)(\beta - L)(\alpha^2 + \beta^2 + \alpha\beta + \alpha L + \beta L + L^2 - 4\alpha L_0 - 4\beta L_0 - 4LL_0 + 6L_0^2)}{6\sigma^2} \end{aligned} \quad (8)$$

The objective minimand then is

$$\varphi(L, \alpha, \beta) \equiv \frac{(\omega(L) + \kappa)}{v(L)} = \frac{\kappa\sigma^2}{(\beta - L)(L - \alpha)} + q \left(\frac{\alpha^2 + \alpha\beta + \beta^2 + \alpha L + \beta L + L^2}{6} - \frac{2L_0(\alpha - \beta + L)}{3} + L_0^2 \right) \quad (9)$$

where $\kappa \geq 0$ is the fixed cost of transaction (assumed). A corporation's objective is to minimize the expected excess cost of capital by optimally choosing $\alpha = \hat{\alpha}$, $\beta = \hat{\beta}$ and $L = \hat{L}$. Because of the symmetry postulated, optimal return point is at the ideal leverage, L_0 - which is half-way between $\hat{\alpha}$ and $\hat{\beta}$, and

$$\hat{L} = \frac{\hat{\alpha} + \hat{\beta}}{2} = L_0.$$

Upon further simplification because of underlying assumption of symmetry, one can have the following:

$$\varphi(L) = \frac{\kappa\sigma^2}{(L_0 - \alpha)^2} + \frac{(L_0 - \alpha)^2}{6}q \quad (9^*)$$

Minimization of $\varphi(L)$ with respect to α yields:

$$\hat{\alpha} = L_0 - \sqrt{\left\{ \frac{6\kappa\sigma^2}{q} \right\}} \quad (10)$$

and

$$\hat{\beta} = L_0 - \sqrt{\left\{ \frac{6\kappa\sigma^2}{q} \right\}} \quad (11)$$

Substitution of $\hat{\alpha}$, $\hat{\beta}$, and \hat{L} in the objective function results in:

$$\hat{\varphi} = \sqrt{\frac{2\kappa q \sigma^2}{3}} \quad (12)$$

which signifies that the cost of capital includes flotation and stock repurchase costs in stochastic structure and the cost of stochastic deviation from L_0 . Generalization of this basic paradigm into a model of leverage indifference with exogenous barriers, symmetric transaction costs and positive drift parameter gives rise to optimum return point:

$$L^* = \frac{1}{\varepsilon} \ln \left(\frac{e^{\beta\varepsilon} - e^{\alpha\varepsilon}}{\varepsilon(\beta - \alpha)} \right) \quad (13)$$

and the optimal mean leverage is defined by:

$$\hat{L}^* = \frac{A + B}{C} \quad (14)$$

where

$$A \equiv e^{\alpha\varepsilon}(1 + \beta\varepsilon)^2 - e^{\beta\varepsilon}(1 + \alpha\varepsilon)^2, \quad B \equiv -(e^{\beta\varepsilon} - e^{\alpha\varepsilon}) \left\{ (\alpha + \beta)\varepsilon + 2 + \left\{ 1 + \ln \left[\frac{e^{\alpha\varepsilon} - e^{\beta\varepsilon}}{(\alpha - \beta)\varepsilon} \right] \right\}^2 \right\}$$

$$C \equiv 2\varepsilon \left\{ (\beta e^{\alpha\varepsilon} - \alpha e^{\beta\varepsilon}) + (e^{\alpha\varepsilon} - e^{\beta\varepsilon}) \left\{ 1 - \ln \left[\frac{e^{\alpha\varepsilon} - e^{\beta\varepsilon}}{(\alpha - \beta)\varepsilon} \right] \right\}^2 \right\}, \quad \text{where } \varepsilon \equiv -\frac{2\mu}{\sigma^2}.$$

We can create other scenarios and paradigms. With foreign ownership these pecking orders maximize returns and minimize costs involved in pecking order, particularly for firms in less-developed countries.

Based on these theories some empirical results have found positive effects of foreign ownership on firm's performance (e.g., Willmore, 1986; Piscitello and Rabbiosi, 2005). Others have reached opposite results on the link between foreign ownership and financial performance (e.g., Kim and Lyn, 1990; Khawar, 2003).

This paper aims to contribute to the on-going debate to serve not only the policy-makers in deciding which path should be taken in emerging economies, but also the literature to fill the gap on the link between foreign ownership and financial performance in emerging countries and specifically Egypt. We believe that this paper is a unique contribution to the literature as it sheds the light on the impact of various degrees of foreign ownership on financial performance in Egypt.

Using a panel of 8,185 companies in Egypt for the period of 2006-2010, we find that foreign ownership in Egypt has a significant positive impact on financial performance. The results show that foreign ownership significantly improves profits, an increase of 10% in foreign ownership increases the ROA and ROE by 2.3% and 2.1% respectively. Foreign ownership also has a significant and positive effect on debt (decreases debt), which can be explained by the ability of foreign owners to improve firms' access to finance.

The remainder of the paper is organized as follows: Section II contains the literature review. Section III describes the data and the sample construction. Section IV presents the empirical methodology. In Section V we show the empirical results and a discussion of these results and section VI concludes.

II. LITERATURE REVIEW

Vast literature compares the financial performance of foreign-owned firms to domestic-owned firms. The numerous studies are divided, while some show that foreign ownership has a significant and positive effect on performance, others find a negative impact. Willmore (1986) found that the financial performances of foreign-owned firms are superior to those of domestic firms. Doms and Jensen (1995) show that foreign-owned companies in the U.S. are more productive compared to domestic-owned. Goethals and Ooghe (1997) examine the effect of foreign ownership on Belgian companies. They find that foreign ownership significantly improves financial performance in Belgian companies. Chhibber and Majumdar (1999) compare the effect of foreign-owned firms in India to domestic on firm performance, and find that foreign ownership improves performance. In the adopted regression models they find a negative and significant effect of the debt ratios. Conyon et al. (2002) analyze the impact of foreign-owned companies on labor productivity in the UK in the period 1987-1996 and find a positive and significant impact of foreign-owned versus domestic-owned. Akimova and Schwödiauer (2004) find that foreign ownership improves firm's financial performance in Ukraine except for companies with relatively high concentrated foreign ownership. Their results show that the relationship between foreign ownership and firm performance is non-linear, reflecting an increase in firm performance with higher foreign ownership up till a certain degree, and then the performance decreases when foreign ownership is close to majority ownership. Arnold

and Javorcik (2005) reach similar results in their research on the relationship between foreign-owned firms and total productivity in Indonesia. Piscitello and Rabbiosi (2005) show the positive impact of ownership change on financial performance based on the data of Italian companies. Alan and Steve (2005) study the short and long term effects of foreign ownership on UK companies during the period 1984 to 1995. They show that foreign ownership has a significant and positive effect on financial performance.

Aydin et al. (2007) examine the effect of foreign ownership on financial performance on firms in Turkey; the results show a positive impact of foreign ownership on the firms' performance.

On the other hand, the study of Kim and Lyn (1990), covering 54 multinational companies in the period 1980-1984, show that foreign firms in the U.S are less profitable and have higher levels of debt compared to domestic firms. Aitken and Harrison (1999) used a data set of 43,010 observations covering firms in Venezuela in the period 1976-1989 to examine the impact of foreign-owned firms on firm performance. The findings show no evidence supporting the presence of technology spill-overs from foreign-owned firms to domestic-owned firms.

Konings (2001) tests the effect of FDI on the performance of firms in Bulgaria, Romania and Poland, for the period from 1993 to 1997. Their results show that foreign firms perform better only in Poland, compared to the domestic companies. Khawar (2003) finds that foreign ownership has no positive spill-over effect on the manufacturing sector in Mexico.

The study of Goerg and Stroebl (2003) indicates that foreign firms in Ireland are more likely to close down and this is similar to the results of Bernard and Jensen (2007) which focus on multinationals in the United States. Barbosa and Louri (2005) show that there is no significant difference in performance between domestically owned and MNCs operating in Portugal and Greece.

On the effect of foreign ownership on firm performance in Egypt there are a limited number of papers. Ben Naceur et al. (2007) investigate 95 firms in Egypt Morocco, Tunisia, and Turkey, and they find a positive impact of foreign ownership on profits and output. In another study, Omran et al. (2008) with a sample of 304 companies from four countries, namely Egypt, Jordan, Oman and Tunisia during the period 2000-2002 find no significant impact of foreign investors on firm performance. Omran (2009) examines 52 newly privatized companies in Egypt, and he finds that foreign ownership has a positive impact on firm performance.

Summarizing the numerous studies on the relation between foreign ownership and firm performance suggest that there is no conclusive result; therefore we aim to examine the effect of foreign ownership on the financial performance using a larger sample (8,185) of firms in Egypt and to evaluate how compatible the results are with pervious results. A major shortcoming of the majority of the literature is that the distinction is made between foreign-owned and domestic-owned firms, without differentiating between the various degrees of ownership. Only a limited number of studies (e.g., Blomström and Sjöholm, 1999; Chhibber and Majumdar, 1999; Akimova and Schwödiauer, 2004) have investigated the effect of the degree of foreign ownership on firm performance, where the range of foreign ownership is divided into a number of subsamples referring to majority foreign ownership, minority foreign ownership, and complete foreign ownership. To fill this gap in the literature we compare the effect of various degrees of foreign ownership on firm performance, with the use of six

subsamples to refer to various degrees of foreign ownership ranging from zero foreign ownership to complete foreign ownership.

III. DATA AND VARIABLES DESCRIPTION

The data were collected from the database of the General Authority of Free Zones and Investment (GAFI) in Egypt. We started with a sample of 10,000 companies registered at GAFI, which was then reduced to 8,158 companies, as we restricted our sample to only include the companies with available financial statements for a minimum of two years within the period 2006-2010. This restriction and the removal of outliers resulted in the reduction of the number of observations to 19,865 observations. This total sample is divided into two sub-samples: the first sample includes 14,312 observations of companies without foreign ownership; while the second sample comprises 5,553 observations from companies with foreign ownership. The total sample is well-diversified as it includes small, medium and large companies with sizes (measured in terms of total assets) ranging from \$1million to \$794 million; and covers most of the economic sectors in the Egyptian Economy (the Agricultural Sector, Construction Sector, Financial Sector, Industrial Sector, Information Technology Sector, and Service Sector). The frequency of the data is annual.

Based on the literature review, we find that there is not a unified model framework that explains the relationship between foreign ownership and firm performance. We basically adopt the model by Mueller et al. (2003), with some adjustments to include control variables and accommodate for data availability (Caves, 1996). In this study the independent variables are return on assets (ROA), return on equity (ROE), and the debt ratio (DR). ROA is defined as the ratio of net income to total assets, and shows the ability of firms in generating income from assets. ROE is calculated as the ratio of net income to total equity, and indicates the efficiency of generating profits from shareholders' equity. These ratios are used extensively in the literature as measures of profits. DR is the ratio of total debt to total assets, and captures the leverage of the firm.

The independent variable is foreign ownership (FO), and it refers to the percentage of equity held by foreign owners in a company (Lee, 2008). The traditional approach of including the effect of foreign ownership is with the use of a dummy variable (Yudaeva et al., 2003). However, as the focus of the study is to compare various levels of foreign ownership, the traditional approach is inappropriate.

To deal with the possibility that a variety of variables can jointly affect firm performance and foreign ownership and hence cause correlation between them, we introduce a number of control variables in the model. We control for the size (S), measured by the natural logarithm of total assets (Zeckhouser and Pound, 1990). The importance of controlling for size is based on the results of Fama and French (1995), who have concluded that small firms have, on average, lower earnings (scaled by book value of equity) compared to large firms. This can be explained by the ability of large firms to utilize economies of scale and scope compared to small firms. The model includes another control variable, namely age (A), measured by the number of years since the company has been founded (Morck et.al, 1988).

We include other variables such as the asset turnover ratio (AT), measured as sales divided by total assets, current ratio (CR), which is the ratio of current assets to

current liabilities, and net profit margin (NPM), which is the ratio of net income to sales. The definitions of all dependent and independent variables are found in Appendix 1.

Table 1 provides the summary statistics for the two subsamples. It shows the mean, median, and t-test for the significant difference in means, and the Wilcoxon test for the significant differences in medians for all variables.

The sample includes 14,312 companies without foreign ownership and 5,553 companies with foreign ownership during the period from 2006 to 2010. The mean and median of the foreign ownership ratio for the foreign firms is equal to 60%. The test-statistics for the significant difference in means and medians show that companies with foreign ownership have significantly higher ROA, ROE, NPM, and AT compared to companies without foreign owners. It is worth noting that companies with foreign ownership are significantly larger in size and older in age than companies without.

The mean (median) of the ROA is 6.9% (4.6%) for companies without foreign ownership compared to 7.9% (5.4%) for companies with foreign ownership. The mean (median) of the ROE for companies without and with ownership are 17.1% (12.9%) and 18.3% (14.6%), respectively. The mean (median) of net profit margin is significantly higher for companies with foreign ownership 3.7% (7.6%), compared to the mean (median) of companies without foreign ownership 1.6% (5%).

Table 1

Summary statistics for companies with and without foreign ownership

Table (1) provides the summary statistics for a sample of 8,158 companies in the period 2006-2010. The total number of observations is 19,865 observations. In the first three columns we report the means, medians and number of observations for the firms' main financial indicators without foreign ownership. The next three columns report the same for firms with foreign ownership. Columns seven and eight test the hypothesis of no significant difference in means (t-statistics) and medians (Wilcoxon test) with and without foreign ownership. *, **, and *** denote significance at 90%, 95% and 99% confidence level respectively. All variables are defined in Appendix 1.

	Without Foreign Ownership			With Foreign Ownership			t-test for the difference in means	Wilcoxon test for the difference in medians
	Mean	Median	# of Obs.	Mean	Median	# of Obs.		
Age	11.71	10.89	14,312	13.30	11.07	5,553	13.35***	7.49***
Asset Turnover	1.19	0.71	14,312	1.01	0.79	5,553	-8.89***	6.81***
Current Ratio	2.95	1.31	14,312	2.62	1.33	5,553	-3.39***	0.21
Debt Ratio	0.10	0.00	14,312	0.10	0.00	5,553	0.19	4.21***
Foreign Ownership	0.00	0.00	14,312	0.59	0.60	5,553	202.64***	109.55***
Net Profit Margin	0.02	0.05	14,312	0.04	0.08	5,553	1.01	10.05***
Return on Assets	0.08	0.05	14,312	0.08	0.05	5,553	4.05***	4.49***
Return on Equity	0.17	0.13	14,312	0.18	0.15	5,553	2.58***	3.28***
Size	3.98	3.99	14,312	4.43	4.44	5,553	30.14***	28.33***

We also examine the effect of the different levels of foreign ownership on financial performance. Table 2 provides the results, that include the means and medians for six subsamples based on various degrees of foreign ownership, ranging from zero to 100%. The first sample covers the companies with zero foreign ownership, the second covers the companies with foreign ownership in the range from more than zero to 20%, the third sample includes firms with foreign ownership ranging from 20% to 40%. The fourth, fifth and sixth samples cover the ranges 40% to 60%, 60% to 80%, and 80% to 100% foreign ownership respectively. Table 2 shows that the means and medians for S, NPM and ROA for companies with zero foreign ownership and companies with 80% to 100% foreign ownership are relatively lower compared to other ranges of ownership. It is worth noting that the median of the ROA for companies at the zero degree of foreign ownership and the 100% foreign ownership are 4.5% and 4.7%, respectively. On the other hand the median for companies with foreign ownership reaches the highest level in the foreign ownership range 20%-40% at 6.6%. The medians of NPM for companies with foreign ownership in the range 20%-40% and 40%-60% are in the range between 7.8% and 10% ,which are relatively higher when compared to the medians for companies with zero and 80% to 100% ownership (5% and 5.7%, respectively). To sum up, the results indicate that companies with highly concentrated domestic ownership (zero foreign ownership) and highly concentrated foreign ownership (80%-100%) are relatively less profitable.

After dividing the data into six different subsamples based on the foreign ownership ratio, we investigate the effect of foreign ownership on a company's performance in various sectors. Table 3 shows the effect of foreign ownership on a company's performance in seven different sectors which are the information technology sector, the construction sector, the financial sector, the service sector, the agricultural sector, the tourism sector, and the industrial sector. It provides the means, medians, and t-statistics for the significant difference in means between companies with and without foreign ownership in each sector. Our results show that companies with foreign ownership are relatively larger in size compared to companies without foreign ownership for all sectors. Foreign ownership has no significant effect on profitability for companies in the information technology sector, the construction sector, and the agricultural sector. Foreign ownership has a significantly positive effect on profitability of companies in the service sector, tourism sector, and the industrial sector while it has significantly negative effect on the profitability of companies in the financial service sector.

The means (medians) of ROA for companies in the financial sector without and with foreign ownership are 7.4% (4.7%) and 5.3% (2.7%), respectively. In the financial service sector, the ROE for companies without and with foreign ownership have means (medians) of 18% (12.9%) and 11.7% (9.6%), respectively. In the tourism sector, the means (medians) of ROA for companies without and with foreign ownership are 4.2% (2.9%) and 8.7% (5.3%), respectively. The means (medians) of ROE for companies in the tourism sector without and with foreign ownership are 9.7% (7.7%) and 17.3% (12.1%), respectively.

Foreign ownership significantly increases the debt ratio (DR) in companies in the construction and financial service sectors. This can be explained by the superior ability of foreign-owned firms to have access to finance.

Table 2
Summary statistics for companies based on the range of foreign ownership

This table provides the summary statistics for 8,158 companies in the period 2006-2010 (total number of observations is 19,865 observations). Table (2) shows six samples covering ranges of foreign ownership starting from zero ownership and ending with 100% foreign ownership. It reports the means, medians and number of observations for the companies' financial indicators each of the six ranges of foreign ownership. All variables are defined in Appendix 1.

	Zero Foreign Ownership			Foreign Ownership between 0% - 20%			Foreign Ownership between 20% - 40%		
	Mean	Median	# of Obs.	Mean	Median	# of Obs.	Mean	Median	# of Obs.
Asset Turnover	1.199	0.790	14,312	0.783	0.553	1,119	0.931	0.704	758
Current Ratio	2.960	1.319	14,312	2.328	1.332	1,119	2.962	1.446	758
Debt Ratio	0.100	0.000	14,312	0.145	0.004	1,119	0.110	0.000	758
Foreign Ownership	0.000	0.000	14,312	0.080	0.080	1,119	0.313	0.314	758
Net Profit Margin	0.016	0.050	14,312	0.093	0.082	1,119	0.140	0.100	758
Return on Assets	0.069	0.045	14,312	0.065	0.052	1,119	0.087	0.066	758
Return on Equity	0.171	0.129	14,312	0.145	0.117	1,119	0.166	0.149	758
Size	3.984	3.991	14,312	4.613	4.705	1,119	4.554	4.525	758
	Foreign Ownership between 40% - 60%			Foreign Ownership between 60% - 80%			Foreign Ownership between 80% - 100%		
	Mean	Median	# of Obs.	Mean	Median	# of Obs.	Mean	Median	# of Obs.
Asset Turnover	0.978	0.666	891	1.019	0.598	669	1.179	0.916	2,116
Current Ratio	2.553	1.422	891	2.711	1.321	669	2.667	1.249	2,116
Debt Ratio	0.083	0.000	891	0.118	0.000	669	0.076	0.000	2,116
Foreign Ownership	0.507	0.500	891	0.717	0.730	669	0.973	1.000	2,116
Net Profit Margin	0.062	0.078	891	0.096	0.095	669	-0.058	0.057	2,116
Return on Assets	0.084	0.060	891	0.090	0.056	669	0.078	0.047	2,116
Return on Equity	0.192	0.143	891	0.192	0.167	669	0.203	0.161	2,116
Size	4.303	4.327	891	4.504	4.439	669	4.342	4.336	2,116

Table 3
Summary statistics for companies based on industry

This table provides summary statistics for a sample includes 8,158 companies in the period 2006-2010 with a total number of observations of 19,865. In this table, we break down the data based on the industry. For each industry, the first six columns report the means, medians and number of observations for companies' financial indicators without and with foreign ownership. Column seven tests the hypothesis of no significant difference in means (T-statistics) with and without foreign ownership. *, ** and *** denote significance at the 90%, 95% and 99% confidence level respectively. All variables are defined in Appendix 1.

Information Technology Sector							
	Mean without Foreign Ownership	Median without Foreign Ownership	# of Obs.	Mean with Foreign Ownership	Median with Foreign Ownership	# of Obs.	t-test for the Difference in Means
Asset Turnover	1.389	1.165	693	1.317	1.037	262	-0.86
Current Ratio	3.743	1.714	693	3.040	1.501	262	-1.74*
Debt	0.030	0.000	693	0.030	0.000	262	-0.01
Foreign Ownership	0.000	0.000	693	0.602	0.560	262	27.62***
Net Profit Margin	-0.010	0.062	693	0.037	0.056	262	0.96
Return on Assets	0.098	0.075	693	0.076	0.069	262	-1.46
Return on Equity	0.204	0.201	693	0.216	0.169	262	0.47
Size	3.628	3.579	693	3.881	3.836	262	3.62***
Construction Sector							
Asset Turnover	1.036	0.546	1606	0.641	0.335	366	-7.14***
Current Ratio	2.954	1.280	1606	2.587	1.375	366	-1.33
Debt	0.090	0.000	1606	0.122	0.000	366	2.23**
Foreign Ownership	0.000	0.000	1606	0.491	0.490	366	26.91***
Net Profit Margin	0.100	0.046	1606	0.161	0.078	366	0.46
Return on Assets	0.060	0.034	1606	0.051	0.034	366	-1.19
Return on Equity	0.170	0.119	1606	0.154	0.122	366	-1.08
Size	4.047	4.092	1606	4.696	4.700	366	11.06***

Table 3 (continued)

Financial Sector							
	Mean without Foreign Ownership	Median without Foreign Ownership	# of Obs.	Mean with Foreign Ownership	Median with Foreign Ownership	# of Obs.	t-test for the Difference in Means
Asset Turnover	0.322	0.165	481	0.272	0	453	-1.10
Current Ratio	3.334	1.377	481	3.200	1.350	453	-0.35
Debt	0.069	0.000	481	0.103	0.000	453	2.08**
Foreign Ownership	0.000	0.000	481	0.604	0.605	453	38.72***
Net Profit Margin	0.226	0.314	481	0.218	0.290	453	-0.04
ROA	0.074	0.047	481	0.053	0.027	453	-2.81***
ROE	0.181	0.129	481	0.117	0.096	453	-4.45***
Size	4.578	4.540	481	5.360	5.277	453	11.77***
Service Sector							
Asset Turnover	1.566	1.115	5292	1.411	1.060	1430	-3.71***
Current Ratio	3.245	1.403	5292	2.723	1.362	1430	-3.31***
Debt	0.066	0.000	5292	0.063	0.000	1430	-0.49
Foreign Ownership	0.000	0.000	5292	0.659	0.750	1430	72.98***
Net Profit Margin	0.030	0.049	5292	-0.006	0.062	1430	-1.23
ROA	0.085	0.057	5292	0.094	0.066	1430	1.54
ROE	0.214	0.173	5292	0.250	0.216	1430	3.51***
Size	3.626	3.589	5292	3.994	3.995	1430	13.38***
Agricultural Sector							
Asset Turnover	0.956	0.628	536	0.731	0.539	236	-3.18***
Current Ratio	2.667	1.245	536	2.073	1.111	236	-1.98**
Debt	0.162	0.000	536	0.124	0	236	-1.31
Foreign Ownership	0.000	0.000	536	0.439	0.428	236	19.63***
Net Profit Margin	-0.125	0.044	536	-0.046	0.059	236	0.81
ROA	0.046	0.026	536	0.055	0.028	236	0.82
ROE	0.126	0.091	536	0.103	0.064	236	-1.05
Size	4.208	4.209	536	4.470	4.504	236	4.44***

Table 3 (continued)

Tourism Sector							
	Mean without Foreign Ownership	Median without Foreign Ownership	# of Obs.	Mean with Foreign Ownership	Median with Foreign Ownership	# of Obs.	t-test for the Difference in Means
Asset Turnover	0.857	0.315	1907	0.895	0.354	716	0.62
Current Ratio	2.793	1.106	1907	2.791	1.182	716	-0.01
Debt	0.114	0.000	1907	0.098	0.000	716	-1.09
Foreign Ownership	0.000	0.000	1907	0.553	0.500	716	41.78***
Net Profit Margin	-0.041	0.039	1907	0.055	0.120	716	1.99**
ROA	0.042	0.029	1907	0.087	0.053	716	6.10***
ROE	0.097	0.077	1907	0.173	0.121	716	5.92***
Size	4.192	4.216	1907	4.300	4.331	716	2.60***
Industrial Sector							
Asset Turnover	1.199	0.790	3797	1.013	0.714	2090	-9.83***
Current Ratio	2.960	1.319	3797	2.620	1.331	2090	-4.34***
Debt	0.100	0.000	3797	0.102	0.000	2090	0.46
Foreign Ownership	0.000	0.000	3797	0.593	0.600	2090	124.70***
Net Profit Margin	0.016	0.050	3797	0.031	0.075	2090	0.73
ROA	0.069	0.045	3797	0.079	0.053	2090	3.90***
ROE	0.171	0.129	3797	0.183	0.145	2090	2.57***
Size	3.984	3.991	3797	4.441	4.450	2090	29.26***

Moreover, companies with foreign ownership in the service sector, the financial sector, and industrial sectors have the highest medians of foreign ownership ratios, while companies with foreign ownership in the agricultural and construction sectors show the lowest levels. In companies with foreign ownership, the medians of foreign ownership ratio in the service sector, financial sector, and the industrial sector are 75%, 60%, and 60%, respectively, while the medians in the agricultural sector and construction sector are 42% and 49%, respectively. In addition, companies without foreign ownership in the information technology sector and service sectors have the highest means and medians of ROA and ROE, while companies without foreign ownership in tourism and agriculture sectors have the lowest means and medians of ROA and ROE. Firms with foreign ownership in the information technology sector and the service sector also have the highest means and medians of ROA and ROE, while companies with foreign ownership in the agricultural and financial sectors have the

lowest. On the other hand companies in the financial sector are the largest in terms of size while, companies in the information technology sector are the lowest in size.

To summarize the results of the Table 3, we can conclude that while foreign ownership has a positive significant effect on profitability in some sectors (namely the service sector, the tourism sector and the industrial sector), it has a negative positive result in the financial sector, and no significant result in both the construction and agricultural sector. This signifies that the effect of foreign ownership on profitability is sector specific. The empirical evidence also shows that foreign ownership increases debt in the construction sector and the financial sector.

IV. EMPIRICAL METHODOLOGY

We examine the effect of foreign ownership on company profitability and debt using 8,158 companies during the period from 2006 to 2010. We estimate a panel data model with unbalanced data using the following two equations, each one separately:

$$\text{Profitability}_{it} = \beta_0 + \beta_1 \text{DR}_{it} + \beta_2 \text{FO}_{it} + \beta_3 \text{S}_{it} \quad (15)$$

$$\text{Debt}_{it} = \beta_0 + \beta_1 \text{A}_{it} + \beta_2 \text{AT}_{it} + \beta_3 \text{CR}_{it} + \beta_4 \text{FO}_{it} + \beta_5 \text{NPM}_{it} \quad (16)$$

where $i = 1, 2, 3, \dots, n$ (number of firms) and $t = 1, 2, \dots, T$ (number of years). Equation (15) examines the effect of foreign ownership on company profitability, where return on assets (ROA) and return on equity (ROE) are used as measures of profitability. We control for the effect of two important variables on profitability which are the debt ratio (DR), and company size (S). In equation (16), we investigate the effect of foreign ownership on debt. This second equation includes the dependent variables asset turnover (AT), the current ratio (CR), foreign ownership (FO), net profit margin (NPM) and the control variable Age (A).

Consideration of endogeneity is essential to our analysis in an effort to identify the causality of the empirical relationships. Earlier studies have argued that firm's profitability and debt are endogenously determined. Also, it is essential to address the potential endogeneity between profitability and foreign ownership. It is more likely that companies with relatively better performance have relatively high foreign ownership; and at the same time, foreign ownership improves financial performance. We test for endogeneity in equations (15) and (16), using the Durbin-Wu-Hausman test, to identify whether profitability, debt, and foreign ownership are simultaneously determined. The null hypothesis to test is that an ordinary least squares (OLS) estimator of the same equation would yield consistent estimates: that is, any endogeneity among the regressors would not have deleterious effects on the OLS estimates. A rejection of the null hypothesis indicates that endogenous regressors' effects on the estimates are meaningful, and instrumental variables are required. Table 4 shows that we only reject this hypothesis in equation (15) when examining the endogeneity between debt and profitability. In other words we only have an endogeneity problem in equation (15) between profitability and debt, which we eliminate with the use of a two-stage least squares (2SLS) approach in that equation. We also introduce instrumental variables for debt in equation (15). The choice of the instrumental variables is very crucial as they should be highly correlated with debt; and also have no impact on profitability. We

here selected the variables age, asset turnover, current ratio, and net profit margin as instrumental variables for debt.

Table 4
Endogeneity test

This table reports the Wu-Hausman F and Durbin-Wu-Hausman tests for endogeneity of debt in panel data model in Equation 15. We use a sample of 8,158 companies in the period 2006-2010 with a total number of observations of 19,865. The dependent variables are return on assets (ROA) and return on equity (ROE). ρ -values are reported in parentheses. *, ** and *** denote significance at the 90%, 95% and 99% significance level respectively.

Equation	(1)	(1)	(1)	(2)
	Endogeneity of Debt in Equation 1 using ROA	Endogeneity of Debt in Equation 1 using ROE	Endogeneity of Foreign in Equation 1 using ROA	Endogeneity of Foreign in Equation 2
Wu-Hausman F test	1530 (0.00)***	652 (0.00)***	6.3 (0.12)	5.7 (0.22)

Table 5
Granger causality tests

This table shows results from the Granger causality tests between foreign ownership, debt and profitability, measured by ROA and ROE, using a sample includes 8,158 companies in the period 2006-2010 with a total number of observations of 19,865. *, ** and *** denote significance at the 90%, 95% and 99% significance level, respectively.

Null Hypothesis	F-Statistics	Probability
ROA does not Granger Cause Debt	0.102	0.749
Debt does not Granger Cause ROA	74.894***	0.000
ROE does not Granger Cause Debt	0.008	0.927
Debt does not Granger Cause ROE	0.061	0.804
ROA does not Granger Cause Foreign Ownership	2.244	0.110
Foreign Ownership does not Granger Cause ROA	0.362	0.547
ROE does not Granger Cause Foreign Ownership	0.188	0.664
Foreign Ownership does not Granger Cause ROE	0.015	0.901
Debt does not Granger Cause Foreign Ownership	0.640	0.423
Foreign Ownership does not Granger Cause Debt	0.031	0.858

After obtaining the fitted (estimated) values of the debt, we replace debt in equation (15) by its fitted values.

Greene (2002) and Wooldridge (2000) show that the 2SLS estimator is asymptotically efficient, making it a good candidate for maximum-likelihood estimations. For our panel regression setting, 2SLS is attractive compared with the simple seemingly unrelated regressions (SUR) method as it provides better

identification in estimation. For robustness of our diagnostic tests, we test for causality between profitability, debt, and foreign ownership. We use the Granger (1969) causality test which is a technique for determining whether one time series is useful in forecasting another. Table 5 reports the Granger causality tests between profitability, measured by return on assets (ROA) and return on equity (ROE), debt ratio (DR), and foreign ownership (FO). Our results show that there is no causality between foreign ownership and profitability. Also, there is no causality between foreign ownership and debt. Profitability measured by ROA and ROE does not Granger cause debt, while debt causes ROA. This means we do not have a causality problem.

We use the Hausman specification test (1978) to search for the appropriate model, whether it is a fixed or a random effects model. If there is no significant correlation between the unobserved company-specific random effects and the regressors, then the random effects model is more appropriate. The Hausman test results are shown in Tables 6 and 7, and those results indicate that the fixed effect estimator is consistent for all the models.

Table 6
Estimates of the 2SLS fixed-effects panel model using the whole sample

This table reports the estimates from the two stage least squares fixed-effects panel data models in equations (15) and (16). We use a sample of 8,158 companies in the period 2006-2010 with a total number of observations of 19,865 observations. The dependent variables are return on assets (ROA), return on equity (ROE), and the debt ratio (DR). Z-statistics are reported in parentheses. *, ** and *** denote significance at the 90%, 95% and 99% significance level respectively. All variables are defined in Appendix 1.

Equation	(15) ROA	(15) ROE	(16) Debt
Asset Turnover			-0.0017 (-0.92)
Current Ratio			-0.0008 (-2.57)***
Debt	-5.2446 (-32.33)***	-5.2473 (-15.49)***	
Foreign Ownership	0.2356 (13.81)***	0.2153 (6.04)***	0.0462 (2.17)**
Net Profit Margin			-0.0043 (-3.43)***
ROA			
ROE			
Size	0.0442 (9.31)***	0.1143 (11.52)***	
Industry	Controlled	Controlled	Controlled
No. Of Observations	19,865	19,865	19,865
No. Of Groups	8158	8158	8158
Hausman Test for Random Effect (Chi-Square)	134.8	45.5	68.3
Hausman Test for Random Effect (p-value)	(0.00)	(0.00)	(0.00)

V. Empirical Results

We estimate a two-stage least squares fixed effect panel model consisting of a sample of 8,158 companies for the period from 2006 to 2010. We use equation (15) to examine the effect of foreign ownership, debt, and sizes on company profitability, measured by ROA and ROE, and report the results in Table 6. The analysis of the results show that firm's borrowing has a significant and negative effect on financial performance measured by ROA and ROE which are consistent with a number of studies (e.g., Titman and Wessels, 1988; Tian and Estrin, 2007; Lin, Zhanga, and Zhu, 2009). This strong negative relationship between debt ratios and profitability can be explained by the risk and poor performance accompanied by the excessive use of debt. The results show that foreign ownership significantly improves performance. This result is consistent with some of the empirical evidence (e.g., Willmore, 1986; Goethals and Ooghe, 1997; Lui et al., 2000; Piscitello and Rabbiosi, 2005). Foreign ownership has a highly significant and positive effect on ROA and ROE. An increase of 10% in foreign ownership increases the ROA and ROE by 2.3% and 2.1%, respectively. Our results show that company size has a significant and positive effect on ROA and ROE. A company with a relatively larger size is relatively more profitable.

In equation (16), we examine the effect of foreign ownership on debt. Table 6 shows that foreign ownership has a significant and positive effect on debt. When a foreign investor owns shares in a company, he can help improve the company's access to finance. Moreover, net profit margin has a negative and significant effect on debt. As profitability increases, the firm's retained earnings increases leading to more cash and less dependence on external funds. This result is consistent with the empirical evidence shown by Lin, Zhanga, and Zhu (2009), who find a significant negative effect of profitability on firm's access to bank loans in China. Lastly the results indicate that the current ratio has a significant and negative effect on debt.

As a robustness test, we estimate equations (15) and (16), using a sample that only includes the companies with foreign ownership. The results are presented in Table 7 and are similar to the results based on the complete sample (companies with foreign ownership and companies without foreign ownership), and they affirm that our results are robust. In estimating equation (16), using only companies with foreign ownership, the results show that foreign ownership has no effect on debt.

VI. CONCLUSIONS

Literature is divided about the effect of foreign ownership on firm performance. In this paper, we explore this issue by use of a panel of 8,185 companies in Egypt for the period of four years from 2006 to 2010. The use of a robust panel data model, after controlling for firm's characteristics, shows that foreign ownership improves profitability significantly. Our results also indicate that foreign ownership has a significant and positive effect on debt, as foreign investors can improve the firm's access to finance.

Table 7
Estimates of the 2SLS panel model using only companies with foreign ownership

This table reports the estimates from the two stage least squares panel data models in Equations 15 and 16. We use a sample of 2202 companies with non-zero foreign ownership in the period 2006-2010 with a total number of observations of 5597. The dependent variables are return on assets (ROA), return on equity (ROE), and debt ratio. Z-statistics are reported in parentheses. *, ** and *** denote significance at the 90%, 95% and 99% significance level, respectively. All variables are defined in Appendix 1.

Equation	(15) ROA	(15) ROE	(16) Debt
Asset Turnover			-0.009 (-1.63)
Current Ratio			-0.001 (-0.91)
Debt	-5.851 (-21.12)***	-6.655 (-16.33)***	
Foreign Ownership	0.152 (7.13)***	0.151 (8.18)***	0.020 (0.56)
Net Profit Margin			-0.002 (-0.90)
ROA			
ROE			
Size	0.075 (9.02)***	0.070 (10.71)***	
Industry	Controlled	Controlled	Controlled
No. Of Observations	5553	5553	5553
No. Of Groups	2202	2202	2202
Hausman Test for Random Effect (Chi-Square)	35.57	7.69	22.60
Hausman Test for Random Effect (p-value)	(0.00)	(0.052)	(0.00)

When addressing the impact of various degrees of foreign ownership on firm performance, the evidence suggest that concentration of ownership whether domestic (zero foreign ownership) or foreign (80-100% foreign ownership) are associated with relatively low levels of firm performance. However, the increase of foreign ownership has a positive impact on firm performance up to a certain level, and then the firm performance decreases when the foreign ownership nears 100%.

When differentiating between the various sectors in the market, we find that our results are sector-specific; hence foreign ownership has a positive, negative or no effect on firm performance depending on the sector of the firm. Our findings suggest that firm's borrowing has a significant and negative effect on financial profitability. This can be understood as the excessive use of debt increases risk and may lead to poor performance. The results show that company size has a significant and positive effect on ROA and ROE, while net profit margin has a negative significant effect on debt. As profitability increases, the firm's retained earnings increases, and that leads to more cash and less dependence on external funds.

As a result of robustness test, we also examine the effect of different levels of foreign ownership on performance, using only companies with foreign ownership. We find that results are similar to the results using the complete sample, and that indicates that our results are robust. Generalization of these conclusions is dependent on the results of similar studies that examine the impact of foreign ownership on financial performance of firms operating in other emerging economies. Moreover the study at hand can be further developed with the use of a panel data Tobit model, and the use of other control variables. Future research should explore the effect of foreign ownership on factor productivity, and should further investigate the sectoral differences and the effect of various degrees of foreign ownership.

Appendix 1

Description of the variables

Variables	Description
Age (A)	Number of years since a firm is founded
Asset Turnover (AT)	Ratio of sales to total assets
Current Ratio (CR)	Ratio of current assets to current liabilities
Debt Ratio (DR)	Ratio of total debt to total assets
Foreign Ownership (FO)	Percentage of equity ownership held by foreign investors in a company
Net Profit Margin (NPM)	Ratio of net income to sales
Return on Assets (ROA)	Net income divided by total assets
Return on Equity (ROE)	Net income divided by total equity
Size (S)	Natural logarithm of total assets

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