

Organizational ability and firm performance in transition economies:

The case of Egypt

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ABSTRACT

Research into transition economies reveals that firms in countries that are transitioning from a socialist to a market orientation must overcome many challenges that are unique to their environment. These challenges call for organizational abilities targeted to the unique problems that firms in transition economies face. Using a two-stage data envelopment analysis, we quantify organizational ability for transition economy firms using Egypt as a test case. We validate our measure by relating organizational ability to firm performance. We also show that organizational ability has persistent qualities. We find high ability firms are positively associated with future firm performance, whereas low ability firms are negatively associated. These results confirm our intuition that organizational ability is a significant driver of firm performance for a cross-section of firms in Egypt's transition economy. In additional tests, we also investigate the determinants of organizational ability for transition economy firms. We show that low levels of government ownership and high-quality auditors are positively associated with greater organizational ability. In contrast, high levels of state ownership are negatively associated with organizational ability. We contribute to the literature on transition economies by showing that firms' organizational ability helps firms overcome the specific challenges presented by economic transition.

INTRODUCTION

Organizational ability and firm performance in transition economies: The case of Egypt

The institution-based view (Meyer and Peng 2005) theorizes that firms in transition economies face different challenges than firms in developed economies. To overcome these challenges, firms need a particular set of organizational factors tailored to their institutional environment. Existing research has suggested a variety of organizational factors that contribute to performance in transition economies, including strategic management (Peng and Heath 1996), organizational learning (Uhlenbrock et al. 2003), resource management (Uhlenbrock et al. 2003), capacity for change (Judge 2009), and innovative ability (Ramadani 2019). While prior studies examine individual elements of organization performance, we suggest that a measure of overall organizational ability may contribute to our understanding of firm performance in transition economies. In this study, we apply a two-stage approach using data envelopment analysis (DEA) to quantify organizational ability for firms in transition economies, using Egypt as a test case. In a third stage, we relate organizational ability to firm performance (Demerjian, Lev, and McVay, 2013; Banker and Park, 2020). This approach follows the principles previously applied to quantify managerial ability at the corporate level and generates new insights about the determinants and implications of organizational ability in a transition economy setting.

Due to the rapidly changing institutional landscape, transition economies represent a unique, theoretically-important, and understudied context for evaluating the significance of organizational ability in firm performance (Peng 2001). The institution-based view suggests that institutions are far more important to firm outcomes in transition economies than in developed economies because of the greater variation and frequency of change in transition economy institutions (Meyer and Peng 2016). It is in this context of rapid institutional change that we

examine the impact of organizational ability on firm outcomes. Meyer and Peng (2016) highlight four institutional challenges that transition economy firms must overcome: uncertainty, unique agency relationships, transaction costs, and unenforced market regulations. Organizational elements targeted to each of these institutional challenges enable firms in transition economies to succeed. In an environment where formal institutional constraints such as laws and regulations and enforcement are weak, firms with organizational ability have the necessary tools to deal with such challenges. As such, transition economies offer an interesting context for studying organizational ability, particularly as the global economy expands to incorporate a widening variety of national economies.

Because of the specific institutional and economic hurdles they encounter, organizational ability may be particularly crucial in firm performance for firms in transition economies. For example, firms must develop superior organizational structures and capabilities in order to thrive despite institutional uncertainty (Uhlenbruck et al. 2003) and navigate the complex web of agency conflicts that exist in transition economies (Bruton et al. 2015). Firms with high organizational ability are also expected to use informal practices and be better able to redesign their organizational forms to reduce transaction costs arising from information asymmetries and low contract enforcement (Bruton et al. 2015). Finally, high ability firms are better able to create and utilize networks to fill the institutional void in market regulations (Puffer et al. 2010).

The literature has largely compartmentalized the effect of the various elements of the organization in creating value and has ignored the overarching impact of organizational ability on firm performance in transition economies. Organizational ability is at the heart of many of the questions that have been posed thus far regarding the influence of organizational structure, resource management practices, creative ability, and capacity for change on transition economy

firm performance (Anderson and Hyun 2020). While investigating the effect of these individual firm factors tells us how those elements individually affect value for firms in transition economies, it also fails to capture the collective ability of the various parts of the firm to work together to improve firm outcomes (Anderson and Hyun 2020). Therefore we create a measure of firm organizational ability for transition economy firms and validate its usefulness as a determinant of firm performance.

Our data is hand collected from publicly traded firms in Egypt. The data are gleaned from a broad spectrum of sources in the Egyptian context, including firm websites, the Egypt Stock Exchange, and a joint venture between the Egypt Stock Exchange and NASDAQ. The information collected includes financial reporting metrics, audit information, and details of ownership structure for 133 firms in the manufacturing, chemicals, food, metals, retail-wholesale, transport, textiles, and services industries. The cross-section of industries represented in the sample provides a rich context for the study of organizational ability as it affects a range of public firms in a transition economy. Further, our data include state ownership percentages, allowing us to determine the unique associations of government ownership with organizational ability and, ultimately, performance.

We first use data from public Egyptian firms to measure the relative efficiency of Egyptian non-financial firms using DEA. This first stage analysis considers how effectively the various inputs into the revenue production process contribute to the generation of revenue. We use revenue as the primary output of the firm and the costs of goods sold and selling, general, and administrative expenses as inputs, following the research methods of Banker and Natarajan (2008) and Banker and Park (2020).

In the second stage, we regress the measure of efficiency calculated in the first stage on several contextual state variables that are likely to affect firm efficiency. These contextual variables include variables that represent market advantages and partially explain firm efficiency in the transition economy context. They also include variables such as cash flow and revenue/expense intensity that characterize the firm's financial position. Consistent with prior research into ability (Demerjian et al. 2013; Banker and Park 2020), we use the residual from the second stage regression as our measure of firm organizational ability.

We validate our measure of organizational ability with two measures of firm performance, return on assets (ROA) and earnings before interest, taxes, depreciation, and amortization (EBITDA). Our measure of organizational ability is associated with both of our earnings measures. Specifically, we find that EBITDA and ROA are both positively associated with our measure of organizational ability. That organizational ability is positively and significantly associated with both measures of firm profitability validates our measure as a significant factor in transition economy firm performance. Importantly, when we disaggregate high ability firms from low ability firms, we find high ability firms are positively associated with future firm performance, whereas low ability firms are negatively associated. These results confirm our intuition that organizational ability is a significant driver of performance for a cross-section of firms in Egypt's transition economy.

Following the intuition of Bui et al. (2018), we assume that a firm's persistently superior (inferior) organizational ability score is more likely due to better (poorer) organizational ability. Consistent with this intuition, our results suggest that organizational ability may be persistent in both high and low organizational ability firms. That our organizational ability measure and its underlying characteristics are persistent suggests that organizational ability is not a lucky

accident of particular firms, and may indicate that high ability firms are consistently better at responding to the uncertainty of transition economies' institutions and markets (Bui et al. 2018). This finding sheds light on a long-standing question in transition economy research regarding why some firms overcome the challenges of a transition economy while others succumb (Bruton et al. 2015). Further, our results suggest that low organizational ability firms persist in low organizational ability while high organizational ability firms are likely to remain in the high-organizational ability category.

In additional tests, we investigate the determinants of organizational ability for transition economy firms. We show that low levels of government ownership are positively associated with greater organizational ability, while high levels of state ownership are negatively related to organizational ability. These findings are consistent with prior research in which state-owned firms are characterized by soft budget constraints (Bai and Wang 1998), overinvestment in physical assets (Burlingham 2012), and slow market response (Bruton et al. 2015). In short, when the state provides support to firms, the development of organizational ability is not necessary to secure the survival of the firm. In such an environment, the development of organizational ability may be neglected.

In further tests, we examine the influence that knowledgeable firm partners have on organizational ability and firm outcomes. Presumably, the choice of a Big 4 auditor would allow firms to increase their organizational ability following the intuition of Uhlenbuck et al. (2003) who maintain that transition economy firms can improve their performance by learning from partners with greater knowledge and experience. We find that the choice of auditor is a critical determinant of organizational ability, contingent on the level of government ownership. Specifically, we find evidence that Big 4 auditors mitigate the negative association of state

ownership with organizational ability particularly for firms with substantial state ownership. Additionally, we find that firms hiring Big 4 auditors have improved firm performance. These findings are in line with the notion that hiring a BIG4 auditor is one way of increasing organizational ability and that learning from partners with greater knowledge and experience can help firms improve their performance.

Finally, our results indicate that the association of organizational ability with firm performance varies according to the level of government ownership. Organizational ability is positively associated with firm performance for firms with no government ownership. Government ownership enhances the positive impact of organizational ability on firm performance for firms with intermediate and high levels of government ownership. This insight is in line with previous results that some government ownership can be useful for firms in transition economies because it gives those firms access to resources that they can use to create value if coupled with organizational ability.

Our study contributes to several streams of literature. First, we contribute to the growing body of research using DEA to identify and quantify ability in firms. Our findings support the validity of the organizational ability measure obtained using two-stage DEA (Banker and Natarajan, 2008; Demerjian et al., 2013; Banker and Park, 2020). Our three-stage analysis measures transition economy firms' relative efficiency in using resources, validates the first stage output by documenting expected relationships between firm efficiency and contextual variables, and documents significantly positive relationships between profitability measures and organizational ability.

We also contribute to the literature that investigates firm performance in transition economies. Unlike prior studies which have compartmentalized organizational features that help

firms in transition economies adapt and thrive, we create an overall measure of organizational ability that captures the collective ability of the organizational features of the firm to work together to improve firm outcomes. Research undertaken in a country such as Egypt, where the economy is transitioning from a socialist orientation to a market orientation, reveals that firms in these countries must overcome many challenges that are unique to their environment. These challenges call for organizational abilities targeted to the unique problems that transition economies face. We investigate the reasons that organizational ability is important in dealing with these challenges and creating firm value. In so doing, we contribute to the literature on transition economies by showing that firms' organizational ability persistently helps firms overcome the specific challenges of transition economies. Additionally, we address the subject of state ownership, which is extremely important to a country such as Egypt, where the capital market is less developed and where governance mechanisms are still evolving. Our analysis contributes to recent literature that examines the characteristics of hybrid private-government owned firms by showing that the percentage of state ownership is a determinant of organizational ability.

Given that the vast majority of economic activity in transition economies is generated by formerly state-owned firms and newly-organized private firms, the implication of organizational ability on performance for transition economy firms is directly relevant to international multilateral agencies and country-level regulators. The findings apply to those seeking to develop policies that help these firms to improve performance within a transition economy. The conclusion that organizational ability is related to firm performance and that government ownership is a negative predictor of organizational ability are vital contributions of our study.

The remainder of the paper is organized as follows. In the next section, we provide background for our analysis and describe literature that relates to the challenges of transition economy firms with respect to profitability. In the third section, we detail the methodology. In the fourth section, we describe the data and present the results of our analysis. A final section concludes and discusses the implications of this research.

BACKGROUND AND LITERATURE

Transition Economies

Transition economies are those which are shifting from a socialist orientation to a market economy (Chari & Banalieva 2015). The transition spans political, legal, social, and economic institutions and involves reforming institutions to improve market development and the enforcement of rules (Williamson 2000). The institutional setting of transition economies differs significantly from that in developed countries and non-transition emerging economies. Whereas market forces drive business activities in developed countries, the rules and the operations of firms in transition economies are strongly influenced by governments (Chari & Banalieva 2015; Kafouros and Aliyev 2016). This reality has important performance consequences because institutional variations affect the pressures, demands, and costs that firms face. Institutional development and the extent of such reforms may also affect how firms use and exploit their resources to achieve their objectives (Oliver 1997).

The challenges and characteristics of transition economies offer a theoretically-interesting context for studying firm performance. Recently, a growing number of studies investigate organizational factors that contribute to performance in transition economies, such as networks, organizational learning, innovation, and boundary blurring. For example, because

traditional strategies for growth are not viable for firms in transition economies, networks built on trust and informal agreements take the place of formal institutions (Peng and Heath 1996). Additionally, creating alliances with foreign firms to increase organizational learning and developing new networks that improve resource acquisition and management help firms overcome resource constraints such as mediocre assets, overemployment, and ineffective managers (Uhlenbrock et al. 2003). Innovation is another important factor in firm performance for transition economies. In the absence of alternative strategies (e.g., acquisitions), networks with foreign partnerships and government officials compensate for less developed legal frameworks (Shekshnia 2001; Ramadani 2019) and blurring boundaries between government and private ownership allows firms to retain some of the benefits of government ownership but also access the necessary flexibility required to innovate (Shekshnia 2001). Each of these organizational factors have in common the ability of transition economy firms to work around and within the particular challenges of their context to create value. This capacity to respond to the changing environment and, indeed, to change along with it, is another crucial organizational factor of firm performance in transition economies (Judge 2009).

Organizational Ability

Because transition economy firms cannot change their environments, they must adapt their operations and management to respond to new market competition. Organizational ability is at the heart of many of the questions that have been posed thus far regarding the influence of organizational structure, resource management practices, innovative ability, and capacity for change on firm performance. Organizational ability can be defined as the collective ability of the various parts of the organization to achieve organizational goals (Anderson and Hyun 2020). Organizational ability is a core construct in the academic literature as a determinant of

performance. It includes the ability of each part to perform its function and the ability of the parts to work together to create sustainable profits. In our context, organizational ability involves the collective ability of the organizational elements of the transition economy firm to meet the unique challenges posed by the institutional context.

Organizational Ability in the Transition Economy Context

In their institution-based view, Meyer and Peng theorize that transition economies are characterized by four institutional challenges: uncertainty, unique agency relationships, transaction costs, and unenforced market regulations (2016). Firms in transition economies must develop organizational abilities that directly address the characteristics of transition economies in order to thrive. We now examine how organizational ability adapted to the unique transition economy context may help firms overcome each of these challenges.

First, transition economy firms face the challenge of uncertainty. Due to instability of regulatory institutions following the change of government, the formal “rules of the game” are often not clearly defined in transition economies (Meyer and Peng 2016). For example, regulation defining private enterprises and the structure of corporate governance (i.e., accounting requirements, information disclosure, securities trading, and the like) may be ill defined, undefined, or in flux, and legal protections may be weak. The instability in transition economies produces ambiguity and uncertainty, making the business environment difficult to analyze (Uhlenbruck et al. 2003). For firms in transition economies, organizational ability may enhance firm performance by improving firms’ response to uncertainty. For example, Bonsall et al. (2017) argue that managerial ability has the most significant impact on firm outcomes for those firms that operate in highly uncertain environments. By extending the same reasoning to organizations in highly uncertain transition economies, we infer that firms with high ability are

more likely to develop structures that enable strategic and operational flexibility (Uhlenbruck 2003) and buffer risks (Dielemann and Boddewyn, 2012) than are other firms. For example, the instability of regulatory institutions drives firms to develop webs of political networks to provide protection. Firms with high levels of organizational ability can form networks that make the best use of political ties but also prevent political actors from misappropriating firm resources (Dielemann and Boddewyn, 2012).

Secondly, in transition economies, the institutional context (e.g., weak legal protections and the transition from government ownership to private ownership) makes the enforcement of agency contracts problematic. Where external governance mechanisms are weak, emphasis is placed on internal control mechanisms to manage agency costs (Young et al. 2008). However, because regulations are weakly enforced, traditional internal governance structures like boards of directors can be co-opted. As a result, dominant ownership is the primary internal governance mechanism in most transition economies (Young et al. 2008). Dominant ownership gives rise to unique agency relationships which include varying principal-principal conflicts among majority and minority controlling shareholders and the government itself (Bruton et al. 2015; Young et al. 2008). This web of agency relationships can result in suboptimal strategic decisions and higher monitoring and bonding costs (Young et al. 2008). High organizational ability firms may be more effective at managing the web of agency relationships in transition economies in part by developing a reputation of treating minority shareholders well (Young et al. 2008). Reputation acts as a bonding cost, an implicit guarantee against expropriation that lowers agency costs.

Third, firms in transition economies also face higher transaction costs as a result of higher information asymmetry, higher search costs, and higher contract enforcement costs. High ability firms may better control transaction costs. Firms with high organizational ability may be

more adept at attracting higher quality business group members and using informal practices to fill institutional voids and reduce search and enforcement costs (Puffer et al., 2010; Meyer and Peng 2016). Networks also reduce resource dependence on governments (Dielemann and Boddewyn, 2012) and establish informal mechanisms of contract enforcement among members (Bruton et al. 2015). Finally, a firm with higher organizational ability may have more success in partnering with foreign investors because of lower information asymmetries (Meyer and Peng 2016). These partnerships provide access to technology, human capital, and other external sources of goods and services, which would otherwise be costly in the absence of developed market institutions (Bruton et al. 2015; Ramadani et al. 2019). Thus, firms with higher organizational ability have lower search costs, which in turn gives them access to elements that improve firm performance.

Finally, firms in transition economies face the challenge of market regulations that are not fully formed and enforced (Meyer and Peng 2016). In order to compensate for weak market regulation, firms in transition economies must overcome inefficient capital markets (LaPorta et al. 2000), effectively manage risk (LaPorta 2002), and use resources efficiently by refusing to extract rents rather than innovate (Needham 1975; Ramadani et al. 2019). The evidence suggests that high ability firms are better at each of these. Bonsall et al. (2017) show that firms with higher ability managers are able to access credit more readily and with less expense than lower ability firms. This bodes well for firms with high organizational ability trying to access capital in inefficient markets. Additionally, Bonsall et al. (2017) find that firms with more able managers also respond well to risk. Finally, drawing on Demerjian et al. (2013), firms with high ability more efficiently use resources to create firm value, including usage of firm resources to invest in positive net present value projects rather than rent-seeking.

Tools that firms in transition economies use to lower uncertainty, reduce agency and transaction costs, and overcome problems from poor market regulation are each integral parts of a larger puzzle that explains firm performance in transition economies. Organizational ability encompasses these individual pieces and conceptualizes the firm's ability to integrate those pieces into a functional whole in which the various parts of the organization work together seamlessly to create firm value. Although prior literature has measured ability using proxy variables, organizational ability is fundamentally unobservable. The dimension of ability that is most often measured is managerial ability, which has been measured using return on assets, compensation, media attention, and fixed managerial effects (see, e.g., Fee and Hadlock 2003; Tervio 2008; Milbourn 2003; Bertrand and Shoar 2003). Each of these proxy measures is likely to confound ability with other constructs (Banker and Park 2020).

Following Banker and Park (2020) we use a recent development in the measurement of ability pioneered by Demerjian et al. (2013) as an alternative to previous proxy measures of ability. Specifically, we utilize the general model of Demerjian et al. (2013) to quantify managerial ability using two-stage DEA and incorporate suggestions of Banker and Park (2020) and Banker and Natarajan (2008) in determining our first and second stage models. In the first stage, Demerjian et al. (2013) use DEA to create an initial measure of the relative efficiency of each firm within its industry by relating revenue as the primary output of the firm to various inputs to the revenue process. They then estimate a second-stage regression to purge the DEA-generated firm efficiency measure of firm-specific characteristics that aid management's efforts but are not due to managerial ability. The residuals from the second stage represent managerial ability. In the third stage, Demerjian et al. (2013) show that their ability measure is positively associated with firm performance. We follow this three-stage approach to quantify firm

organizational ability for firms in transition economies. We then relate it to the profitability and persistence of firm performance.

RESEARCH DESIGN AND METHOD

Three-Stage Method: Measuring Egyptian Firm Efficiency

Following the approach of Demerjian et al. (2013) and incorporating suggestions of Banker and Natarajan (2008) and Banker and Park (2020), we estimate firm efficiency using DEA in our first stage. The efficiency estimate we obtain from the DEA provides a measure of the relative organizational efficiency of each transition economy firm relative to its peers (Banker et al. 1984). To assess unobservable organizational ability, we use DEA to measure how efficient each firm in our sample is at using its resources to generate revenue. We characterize a high organizational ability firm as one that produces the highest level of output from a given production function and contextual factors (Demerjian et al. 2013). Since we seek to quantify the unobservable organizational ability that resides throughout the organization, we consider how production labor and materials inputs combine with administrative and other non-wage costs to produce output (revenue). Revenue is the traditional measure of output used in Demerjian et al. (2013) and other studies (see, e.g., Bonsall et al. 2017 and Krishnan and Wang 2015) and is our sole output measure. We use the following inputs into the revenue-generating process, following the suggestion of Banker and Park (2020): cost of goods sold and selling, general, and administrative expenses. Banker and Natarajan (2008) show that the method of evaluating productivity in the first stage by matching input consumption and output production, and including contextual variables in the second stage, yields consistent estimators, and we follow their method here. Using line-items of expenses as input items and revenue as an output allows us to measure productivity by matching inflows and outflows. Thus, we expect our

estimators to be consistent when we include contextual variables in the second stage, as we explain below.

Organizational efficiency is determined by the effectiveness of the production labor and materials inputs and managerial/administrative labor to perform their separate functions as well as collaborate to produce outputs of value to customers using firm resources jointly. We apply output-oriented DEA based on variable returns to scale to estimate an efficiency score (Banker et al. 1984). Organizational efficiency is measured as the log value of the efficiency score. We relate this DEA estimate of relative efficiency to contextual variables to obtain measures of organizational ability as residual values in our second stage regression model.

The purpose of the second stage is to estimate organizational ability. As many factors (e.g., contextual variables) may affect efficiency, we seek to eliminate the impacts of these contextual variables by estimating the regression of efficiency on contextual variables. The residuals, then, contain the effects of organizational ability on efficiency. We select and determine state variables that affect firms' efficiency as our contextual variables in line with Banker and Natarajan (2008). In our model we include the following contextual variables as suggested in prior literature and by our context: working capital, operating cash flow, inventory, long-term assets, debt, equity, revenue intensity, positive free cash flows, revenue share, total assets, and plant, property, and equipment. In their measure of managerial ability, Demerjian et al. (2013) suggest that managers of larger firms can more effectively negotiate terms. Similarly, we expect that larger firms have greater bargaining power, and in the context of transition economies, they would have a greater network to exploit; therefore, we include total assets as a contextual variable. Regarding greater bargaining power, we also expect firms with greater revenue share to have greater bargaining power, so we include revenue share as a contextual

variable. Also following Demerjian et al. (2013), we expect firms with positive free cash flows to be able to pursue positive net present value projects more effectively, holding ability constant. Thus, free cash flow and operating cash flow may affect efficiency, and we include them as contextual variables. Uhlenbruck et al. (2003) argue that transition firms' resources give them the flexibility to adapt. Working capital, inventory, long-term assets, PP&E, and revenue intensity are included because we expect them to improve firms' flexibility to adapt to the transitional environment, and be associated with efficiency. We also include debt and equity as additional variables that may influence organizational efficiency because they provide access to financing, which can be challenging in the transition economy.

The model for our second stage is as follows:

$$\begin{aligned} \text{Ln}(\widehat{\text{EFFICIENCY}}_{jt}) = & \quad (1) \\ & \text{WCAP}_{jt} + \text{CFO}_{jt} + \text{INV}_{jt} + \text{PP\&E}_{jt} + \text{LTASSETS}_{jt} + \text{DEBT}_{jt} \\ & + \text{EQUITY}_{jt} + \text{EXPINT}_{jt} + \text{REVINT}_{jt} + \text{REVSHARE}_{jt} \\ & + \text{FCFIND}_{jt} + \text{SIZE}_{jt} + \text{YEAR}_t + \hat{\epsilon}_{jt} \end{aligned}$$

where LnEFFICIENCY is the logarithm of the efficiency score estimated using DEA in the first stage. WCAP is net working capital calculated as total current assets less total current liabilities, scaled by total assets. CFO is the total operating cash flow, scaled by total assets. INV, PP&E, and LTASSETS represent total inventories, plant, property, and equipment, and other long-term assets scaled by total assets, respectively. We include two proxies of firms' financing activities, DEBT and EQUITY, both scaled by total assets. REVSHARE is the firm's market revenue share, and an important variable for transition economy firms in which monopolies are more common. We measure revenue (REVINT) and expense intensity (EXPINT) as total revenue and expenses scaled by total assets. Finally, we also include an indicator variable equal to 1 if the firm's free cash flows (FCFIND) are positive, and 0 otherwise. SIZE is measured as the natural

logarithm of total assets. We include year fixed effects. The residual from Equation (1) is our measure of organizational ability, which is used as the independent variable in the third stage regression model described below.

In our third stage analysis, we endeavor to validate our measure of organizational ability by examining how organizational ability obtained from the second stage affects future firm performance for our Egyptian firms. The model for the third stage analysis is as follows:

$$\begin{aligned} \{EBITDA_{j,t+n}; ROA_{j,t+n}\} = & \quad (2) \\ ABILITY_{jt} + WCAP_{jt} + CFO_{jt} + LTASSETS_{jt} + DEBT_{jt} \\ + EQUITY_{jt} + FCFIND_{jt} + SIZE_{jt} + YEAR_t + \hat{\varepsilon}_{jt} \\ \text{Where: } n \in Z; 1 \dots 2 \end{aligned}$$

where ABILITY is the organizational ability for firm i , the residual from the second-stage regression. All other variables are as defined previously. We include these variables because we expect that they may affect firm performance. By controlling for them, we seek to remove confounding effects, so that we can better understand the impact of ABILITY on future performance (Banker and Natarajan, 2008; Banker and Park, 2020).

In additional analysis, we seek to understand what factors determine organizational ability. The range of government ownership in the cross-section of the economy may be a determinant of organizational ability. Transition economies are characterized by government-owned enterprises making the transition to private firms, purely private firms, and purely government-owned firms (Bruton et al. 2015; Uhlenbruck et al. 2003). These firms receive varying levels of financial help from the government, have variable ability to access funding, and have divergent goals related to employment, profitability, and market share. Firms with access to government resources through their government ownership may not prioritize organizational ability. On the other hand, organizational ability is expected to be critical to private firms with

tight margins and less access to financing. Therefore, we expect that government ownership may be a determinant of organizational ability. Additionally, Uhlenbruck et al. (2003) claim that transition economy firms increase their performance through partnerships with external stakeholders who can provide expertise. Therefore we also include BIG4 as a potential determinant of ABILITY under the assumption that firms can learn from a high-quality external auditor. Our model for this test is as follows:

$$\begin{aligned}
 ABILITY_{j,t+n} = & \quad (3) \\
 & GOVOWN_{jt} + \\
 & + BIG4_{jt} + WCAP_{jt} + CFO_{jt} + LTASSETS_{jt} + DEBT_{jt} \\
 & + EQUITY_{jt} + FCFIND_{jt} + SIZE_{jt} + YEAR_t + \hat{\epsilon}_{jt} \\
 & \text{Where: } n \in Z; 0, 1
 \end{aligned}$$

where GOVOWN is partitioned into categories of insignificant government ownership, (insigniGOVOWN), significant government ownership (signiGOVOWN), and substantial government ownership (substGOVOWN) in additional analysis. We follow Bruton et al. (2015) in the categorization of government ownership. We expect lower levels of government ownership and BIG4 to be positive determinants of ABILITY and higher levels of government ownership to be negative determinants of ABILITY. All variables are as defined in Appendix B.

DATA AND EMPIRICAL RESULTS

Data

To measure organizational ability of firms in transition economies, we use Egypt as a test case. In terms of economic transition, Egypt has much in common with other transition economies. Transition began for Egypt in 1991, roughly the same period of the Central Eastern European countries, whose transition is perhaps more extensively studied in the academic literature. In terms of challenges, Egypt embodies the typical difficulties of former socialist

economies of the early 1990s. Before transition, Egypt's economy was characterized by high public employment and subsidies, rising deficits and inflation, and low growth rates and returns on investment (Alissa 2007). After entering transition, Egypt also weathered another significant transition in the revolution of 2011. Following the 2011 revolution, GDP shrank dramatically while unemployment increased. The consequences of the 2011 revolution continue to impact Egypt's economic transition.

In terms of financial reporting, accounting, and auditing, Egypt is also typical of transitions economies. When transition economies move away from command economies, their accounting and auditing institutions also require reform. Egypt is not an outlier in this regard. Since the beginning of transition in the 1990s Egypt has made significant efforts to align financial reporting requirements with International Accounting Standards and improve compliance in accounting and auditing. Compliance and enforcement have improved during transition, including the adoption of accounting practice law (World Bank 2002). All publicly traded companies in Egypt must prepare their financial statements in accordance with Egyptian financial standards, and those financial statements must be audited by a certified public accountant in accordance with Egyptian auditing standards. With few exceptions, Egyptian accounting standards generally follow International Financial Reporting Standards (IFRS). The World Bank's *Report on the Observance of Standards and Codes* for Egypt notes that Egypt's securities market regulator, the Capital Market Authority, is an active enforcer of rules and regulations regarding financial statements released by publicly traded Egyptian firms (World Bank 2002).

The Egyptian equity market is quite small. For much of our sample period, only 215 companies are listed on the Egypt Stock Exchange. We exclude 36 financial services firms from

our analysis along with 49 firms for which we could not obtain financial statements for the entire sample period. Our remaining sample of publicly listed firms captures approximately 75 percent of the population. We gather data on 130 public Egyptian firms for the period 2009 to 2017. To obtain the data for our study, we first download financial reports directly from firm websites and the Egypt Stock Exchange website. Where we cannot obtain financial reports directly from the firms themselves or the Egypt Stock Exchange, we purchase data from Egypt Information Dissemination, a joint venture between the Egypt Stock Exchange and NASDAQ. We begin with 1,170 firm-year observations. We drop 121 firm-years as a result of missing values to calculate variables for our main analysis and controls. Our final sample is 1,049 firm years.

The information collected includes financial reporting metrics, audit information, and details of ownership structure. Our firms cover a range of industry sectors, including basic resources, health care, real estate, travel, utilities, media, food, transportation, construction, and textiles. The cross-section of industries represented in the sample provides a rich context for the study of organizational ability as it affects a range of firms in a transition economy. Further, our data include state ownership percentages, allowing us to determine the unique associations of government ownership on organizational ability and performance. The sample selection procedure is outlined in Appendix A.

Descriptive Statistics

Table 1, Panel A, contains our descriptive statistics. The mean (median) of EFFICIENCY (table presents untransformed measure) is 0.550 (0.526), and the mean (median) of ABILITY is 0.000 (0.028). Figure 1 provides a graphical representation of the distribution of the ABILITY score. As expected in a transition economy, the mean (median) of COGSEXP is 0.832 (0.897), reflecting overemployment present in the firms in our sample that have state

ownership. The average amount of DEBT as a percentage of total assets is 0.074, which is indicative of the difficulty of obtaining credit in transition economies. Approximately 30 percent of the sample has a big four auditor. Additionally, the mean (median) government ownership is 0.292 (0.135). Minimum government ownership is 0 percent, while the maximum government ownership for firms in our sample is 98.6 percent.

Table 1, Panel B, provides selected descriptive statistics for our sample by industry. Most of our firms are in the food and beverages, real estate, building materials, and resources industries. No single industry makes up more than 17 percent of our total sample. The trade and distributors industry has the highest mean value of ABILITY, closely followed by goods and services and building materials. The lowest mean value of ABILITY is in the travel and leisure, energy, and transportation sectors, industries that also have the greatest government involvement. One-third of the industries in our sample have less than 25 percent government ownership; on average, twenty percent of the industries have greater than 50 percent government ownership. Resources, utilities, media, and transportation, on average, have a higher percentage of BIG4 auditors than the mean firm in our sample. Energy is by far the most profitable industry and is an interesting case. The profitability of the energy industry is indicative of the significance of gas and oil production in Egypt. The industry is 56 percent owned by the Egyptian government, on average, and is characterized by low organizational ability. The presence of these three characteristics suggests that government ownership is associated with lower organizational ability but also that level of ownership provides benefits. Such benefits include access to finances and resources, consistent with Bruton et al. (2015), who argue that firms with government ownership can “utilize the resources the state offers to generate above-average profits” (102).

[INSERT TABLE 1 PANELS A & B ABOUT HERE]

The correlation coefficients of variables are reported in Table 2. Organizational efficiency (lnEfficiency) measured by DEA is positively and significantly correlated with ABILITY, REVENUE, SIZE, REVSHARE, EBITDAtoTA, and ROA. These univariate relationships indicate that these variables are organizational characteristics that are associated with organizational efficiency. Their positive correlations validate their use as control variables in the second stage. ABILITY is positively associated with REVENUE, SIZE, REVSHARE, ROA, and BIG4, suggesting that the higher the ABILITY, the larger the firm, and the better the performance.

[INSERT TABLE 2 ABOUT HERE]

Main Results: Second-Stage Measurement of Organizational Ability

Table 3 presents the results of our second stage regression of EFFICIENCY on control variables that affect firm efficiency. Here we regress the efficiency score estimated in the first stage of DEA on multiple organizational characteristics. As predicted, REVINT, REVSHARE, INV, CFO, and SIZE are positively related to organizational efficiency. LTASSETS and EXPINT have a negative association with efficiency, consistent with transition economy firms being burdened with mediocre assets and overemployment (Uhlenbruck et al. 2003). We measure ABILITY as the residual from this regression and use it as our independent variable of interest in the third stage of our analysis. We draw particular attention to the R-squared, which indicates that the industry-specific variables we use to estimate firm efficiency explain 57 percent of the variance in efficiency for firms in our sample.

[INSERT TABLE 3 ABOUT HERE]

Main Results: Third-Stage Persistence of Organizational Ability

In the third stage of our analysis, we evaluate whether the ability measure is persistent over time. Existing research suggests that ability should persistently lead to superior performance (Bui et al. 2018). Therefore, we suggest that a firm's persistently superior (inferior) organizational ability score is more likely due to better (poorer) organizational ability, whereas lack of persistence might suggest something more akin to luck (Bui et al. 2018). We regress the one, two, and three-year ahead residuals from our second stage regression on ABILITY at time t . Table 4 presents our findings. ABILITY is positively and significantly (p -value < 0.001) associated with all three future measures of ABILITY. This finding indicates that our organizational ability measure and its underlying characteristics are useful in predicting future organizational ability. Further, our results suggest that low organizational ability firms persist in low organizational ability while high organizational ability firms are likely to remain in the high-organizational ability category. In Columns (2), (4), and (6) HIABILITY is positive and significant while LOABILITY is negative and significant in every period. This finding suggests that organizational ability is not a lucky accident for transition economy firms, but an ability that is developed and nurtured by the choices that firms make.

[INSERT TABLE 4 ABOUT HERE]

Main Results: Third-Stage Impact of Organizational Ability on Future Profitability

Having shown that ABILITY has persistent qualities, we turn our attention to validating our measure against firm performance. We regress ABILITY, the residual from the second-stage regression, on two measures of future performance: ROA and earnings before interest, taxes, depreciation and amortization, scaled by total assets (EBITDAtoTA). For each measure of

future firm performance, we investigate the impact of ABILITY on performance one and two years in the future. Because we use lead measures of performance, our sample sizes are smaller in the lead analyses.

Table 5 tabulates the results of our estimation of the third-stage model with ROA and EBITDAtoTA as the dependent variables. The coefficient of ABILITY is positive and significant, indicating the positive impact of ABILITY on EBITDAtoTA and ROA and validating our measure of organizational ability (0.200, p-value < 0.01; 0.037, p-value < 0.01, Columns (1) and (3) respectively). In untabulated tests, when we include indicator variables for the highest and lowest ability firms in our sample, high organizational ability firms are positively and significantly associated with ROA and EBITDAtoTA (p-values < 0.01). In contrast, low ability firms are negatively associated with ROA and EBITDAtoTA (p-values < 0.05). These results validate our measure of organizational ability as an essential factor in the profitability of transition economy firms. Because for firms with high levels of state ownership, performance is often a less critical objective compared to employment and market share maximization, such firms within a transition economy (particularly those that retain some percentage of state ownership) may have some challenges in transitioning towards objectives of profit maximization.

Our results indicate that increasing organizational ability may assist in this transition. This finding is consistent with high organizational ability firms being more adept at using their networks, lowering agency and transaction costs, and overcoming weaknesses in the capital markets.

[INSERT TABLE 5 ABOUT HERE]

Additional Tests: Determinants of Ability

In an additional analysis, we seek to understand what factors determine organizational ability. In transition economies, state-owned enterprises play an essential role in the economy (Bruton et al. 2015). State ownership is important for two reasons: (1) transitioning firms exhibit a range of state ownership and (2) state ownership can have a positive and negative impact on organizational ability. First, while many private firms spring up during the transition period, the largest firms in transition economies are government-owned enterprises making the transition to private firms (Bruton et al. 2015; Uhlenbruck et al. 2003). Often this process happens gradually, resulting in a range of government ownership in the cross-section of the economy. Government-owned firms are often in strategic industries (such as energy in Egypt, as discussed above), and recent research shows that in many transition economies, a hybrid organization has developed, which is not entirely state-owned, but not private either (Bruton et al. 2015). Second, while the development of organizational ability may not be necessary to secure the survival of state-owned firms (resulting in lower observed organizational ability associated with state ownership), state ownership may provide certain benefits, particularly in partially state-owned firms. These hybrid organizations may be able to access the benefits of privatization and the resources of government ownership simultaneously (Bruton et al. 2015). Bruton et al. (2015) argues that to be successful, these firms must be adept at navigating the public-private divide, suggesting a greater need for organizational ability.

Given the importance of government ownership on firms in transition economies, we investigate the impact of state ownership on organizational ability. We begin with a simple regression of GOVOWN on ABILITY. Next, given the range of government ownership observed in transition economies, we regress four categories of state ownership on future

ABILITY. This allows us to identify how different levels of state ownership influence organizational ability. We follow Bruton et al. (2015) in the classification of types of state ownership. Our base category is no state ownership. We define a high level of state ownership (substGOVOWN) as ownership greater than 50 percent, intermediate ownership (signiGOVOWN) as 25 to 50 percent, and low ownership (insigniGOVOWN) as 1 to 25 percent.

Firms with high levels of government ownership may depend on the government to provide infusions of capital and access to resources (Bruton et al. 2015; Uhlenbruck et al. 2003) and may not be accustomed to running efficient operations. Therefore, we expect firms that have higher levels of state ownership to be negatively associated with ABILITY. Our findings in Table 6, Column (1) confirm this intuition, where GOVOWN is negatively and significantly associated with ABILITY (-0.108, p-value < 0.01). Firms with a greater percentage of state ownership are associated with lower ability in time t and the future, as observed in Column (5). Additionally, our results indicate that firms with greater government ownership drive the negative association in the continuous measure of GOVOWN. In particular, Column (2) shows that our intermediate ownership category has a negative and significant association with ABILITY (-0.220, p-value < 0.05) in comparison with the base category of no state ownership. Firms in our high government ownership category (substGOVOWN) also have a negative and significant association with ABILITY (-0.102, p-value < 0.01) which persists into time $t+1$. On the other hand, firms in our low ownership category have a positive relationship with ABILITY, which, though not significant at traditional levels, suggests that as the percentage of state ownership declines, the association with ABILITY becomes positive.

Prior literature suggests that there is a significant relationship between economic reforms and the development of the accounting and auditing profession (Elbayoumi et al. 2019);

therefore, we also investigate BIG4 auditor as a determinant of ABILITY. Presumably, the choice of a BIG4 auditor would allow firms to increase their organizational ability following the intuition of Uhlenbuck et al. (2003) who maintain that transition economy firms can improve their performance by learning from partners with greater knowledge and experience. Thus, we would expect the association of BIG4 and ABILITY to be positive. To test our expectations, we include BIG4 in our model. The main effect of BIG4 on ABILITY in columns (1) through (8) is not statistically significant at conventional levels. However, when we interact BIG4 with GOVOWN in Column (3), we find that the relationship is positive and significant (0.161, p -value < 0.01), suggesting that BIG4 auditors help mitigate the negative association of GOVOWN with ABILITY by providing knowledge and experience that indirectly increase organizational ability. We also interact BIG4 with each of our state ownership categories, and we find that the interaction of BIG4 and substGOVOWN on ABILITY is positive, suggesting that when a firm with substantial government ownership hires a BIG4 auditor, the negative relationship of government ownership with organizational ability is mitigated. This finding is in line with the notion that hybrid firms require greater organizational ability to balance state ownership and privatization, and that hiring a BIG4 auditor is one way of improving organizational ability. The negative coefficient on insigniGOVOWN*BIG4 (-0.817, p -value < 0.01) and signiGOVOWN*BIG4 (-0.878, p -value < 0.01) may suggest that the effect of government ownership on ABILITY decreases when a firm hires a BIG4 auditor.

[INSERT TABLE 6 ABOUT HERE]

We also take our analysis one step further to investigate the relationship of ABILITY with firm performance for different levels of GOVOWN. Prior literature is divided on the effect of state ownership on firm performance (Bruton et al. 2015). We have suggested that ABILITY

has a positive association with firm performance and have provided results to this effect. Others have suggested that the *level* of state ownership (rather than a binary measure of state ownership) is also a reason for conflicting results on the impact of state ownership on firm performance (Bruton et al. 2015). Accordingly, we examine whether the effect of ABILITY on firm performance varies for different values of government ownership. In our additional analysis, we investigate the association of ABILITY with firm profitability as GOVOWN changes. Our results are tabulated in Table 7, Columns (1), and (2). Our results suggest that when GOVOWN is 0 (i.e., the base case in which the firm has no government ownership), ABILITY has a positive association with ROA (0.039, p-value > 0.01). Interacting firms in our intermediate category of government ownership with ABILITY enhances the positive association of ABILITY on ROA (0.173, p-value > 0.01). These insights are in line with previous findings that some government ownership can be useful for firms in transition economies because it gives those firms access to resources that they can use to create value, mainly if organizational ability is also present. We find similar results for firms in the high government ownership category; however, we do not find any significance for the lowest class of government ownership. One reason for this finding is that firms in the lowest class of government ownership may not receive enough benefit from their government relationship to overcome the liabilities associated with government ownership. Additionally, in untabulated results, the interaction of BIG4 with each category of government ownership is positively and significantly associated with ROA, supporting our intuition that firms using BIG4 auditors may improve their performance by learning from partners with greater knowledge and experience (Uhlenbuck et al. 2003)

[INSERT TABLE 7 ABOUT HERE]

CONCLUSION

Research into transition economies reveals that firms in countries that are transitioning from a socialist to a market orientation must overcome many challenges that are unique to their environment. These challenges call for organizational abilities targeted to the unique problems that firms in transition economies face. Using a two-stage data envelopment analysis, we quantify organizational ability for transition economy firms using Egypt as a test case. We validate our measure by relating organizational ability to firm performance and demonstrating the persistence of organizational ability. We find high ability firms are positively associated with future firm performance, whereas low ability firms are negatively associated. These results confirm our intuition that organizational ability is a significant driver of firm performance for a cross-section of firms in Egypt's transition economy. In additional tests, we also investigate the determinants of organizational ability for transition economy firms. We show that low levels of government ownership and high-quality auditors are positively associated with greater organizational ability. In contrast, high levels of state ownership are negatively associated with organizational ability. We contribute to the literature on transition economies by showing that firms' organizational ability is a persistent trait that helps firms overcome the specific challenges of transition economies.

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Appendix A: Sample Procedure

Observations	Data and Description
1,170 firm-year (121)	Observations from 2009 to 2017 for 130 firms. Drop firm-year observations with missing values for revenue and expenses variables.
1,049	Final dataset for the period 2009 to 2017.

Appendix B: Variable Definitions

Variable	Description
EFFICIENCY	Estimated using an output-oriented variable returns to scale, BCC, DEA-model (Banker et al. 1984) assuming firms' production with total revenue as output and inputs as cost of goods sold, administrative expenses and selling expenses.
ABILITY	Residuals obtained by regressing the logarithm of DEA-based efficiency (calculated as above) on contextual factors.
HIABILITY, LOABILITY	Indicator variable equal to one (1) if the ability for the firm-year is greater and less than the median, respectively. LOABILITY is multiplied by -1 to interpret greater score as lower ability.
REVENUE, REVSHARE, EARNSHARE	Total revenues, market revenue share, share of market earnings before extraordinary items based on firm-year, respectively.
COGSEXP, ADMINEXP, SELLINGEXP	Cost of goods sold, administrative expense, and selling expenses, respectively, scaled by total expenses.
REVINT, EXPINT	Total revenue and expenses scaled by total assets.
INV, PP&E, LTASSETS	Total inventories, plant, property, and equipment, and other long-term assets scaled by total assets, respectively.
DEBT, EQUITY, SIZE	Total liabilities and common equity scaled by total assets, respectively. Size is calculated as the logarithm of total assets.
CFO	Total levels in cash flow from operating activities scaled by total assets.
WCAP,	Total current assets less total current liabilities scaled by total assets.
ACCRUALS	Total accruals calculated as earnings before extraordinary items less total cash flows from operations scaled by total assets.
FCFIND	Indicator variable equal to one (1) if the free cash flows are positive for the firm-year, else zero (0).
ROA, EBITDAtoTA	ROA and EBITDAtoTA are proxies for return on assets and best-earning predictor calculated as earnings before interest, taxes, depreciation, and amortization scaled by total assets.
BIG4	Indicator variable equal to one (1) if the firm has Big 4 auditor for the firm-year, else zero (0).
GOVOWN	GOVOWN is a continuous variable broken into control classes based on the percentage of government ownership. Insignificant government ownership, insigniGOVOWN, for 1% to 25% control, significant government ownership, signiGOVOW, between 25% to 50% control, and substantial government ownership, substGOVOWN, for control greater than 50%.

Table 1 – Panel A: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
EFFICIENCY (1)	1,049	0.550	0.222	0.013	0.422	0.526	0.679	1.000
ABILITY (2)	1,049	0.000	0.368	-2.614	-0.152	0.028	0.181	2.330
REVENUE (3)	1,049	19.309	1.849	14.375	18.189	19.455	20.589	23.101
COGSEXP (4)	1,049	0.832	0.176	0.005	0.793	0.897	0.948	0.992
ADMINEXP (5)	1,049	0.137	0.173	0.001	0.038	0.071	0.149	0.945
SELLINGEXP (6)	1,049	0.031	0.054	0	0	0.01	0.04	0
DEBT (7)	1,049	0.074	0.131	0	0.01	0.03	0.1	2
EQUITY (8)	1,049	0.563	0.267	-1.644	0.408	0.600	0.752	0.995
SIZE (9)	1,049	20.244	1.410	17.352	19.277	20.126	21.193	23.639
WCAP (10)	1,049	0.207	0.260	-0.955	0.029	0.187	0.399	0.921
CFO (11)	1,049	0.060	0.126	-0.648	-0.003	0.045	0.117	0.690
FCFIND (12)	1,049	0.298	0.458	0	0	0	1	1
REVSHARE (13)	1,049	0.858	1.758	0.001	0.073	0.264	0.783	12.271
EARNSHARE (14)	1,049	0.858	2.309	-4.100	0.022	0.173	0.668	14.516
ROA (15)	1,049	0.059	0.098	-0.456	0.009	0.050	0.105	0.484
EBITDAtoTA (16)	1,049	0.902	0.224	-0.048	0.821	0.938	1.043	1.395
BIG4 (17)	1,049	0.333	0.471	0	0	0	1	1
GOVOWN (18)	1,049	0.292	0.335	0	0	0.135	0.600	0.986

Winsorize continuous variables at 1st and 99th percentile

Scale rows 7,8,10,11,15,16 by total assets and rows 4 to 6 by total expenses

Revenue and size are logarithmically transformed.

Table 1 – Panel B: Industry Specifics: Select Mean Descriptive

SR	INDUSTRY	NUMOBS	ABILITY	GOVOWN	BIG4	ROA	CFO	ACCRUALS	COGS EXP	ADMIN EXP	SELL EXP
1	Basic Resources	130	0.071	0.469	0.460	0.080	0.084	-0.003	0.926	0.051	0.022
2	Health Care and Pharmaceuticals	95	-0.063	0.178	0.299	0.089	0.100	-0.011	0.787	0.086	0.125
3	Industrial Goods, Services, and Automobiles	38	0.164	0.368	0.236	0.077	0.066	0.010	0.924	0.061	0.014
4	Real Estate	141	0.001	0.482	0.258	0.050	0.008	0.041	0.678	0.293	0.028
5	Travel and Leisure	67	-0.373	0.268	0.151	0.033	0.033	-0.001	0.542	0.433	0.024
6	Utilities	9	0.120	0	0.822	0.046	0.009	0.037	0.934	0.065	0
7	IT, Media, and Communication Services	35	0.069	0.485	0.616	0.055	0.108	-0.053	0.812	0.172	0.014
8	Food, Beverages and Tobacco	175	-0.011	0.102	0.297	0.054	0.067	-0.013	0.899	0.081	0.019
9	Energy and Support Services	9	-0.244	0.555	0.475	0.213	0.222	-0.008	0.985	0.012	0.001
10	Trade and Distributors	9	0.368	0	0	0.012	-0.036	0.049	0.970	0.023	0.005
11	Shipping and Transportation Services	33	-0.167	0	0.648	0.074	0.067	0.007	0.750	0.248	0.001
12	Contracting and Construction Engineering	66	-0.010	0.272	0.183	0.037	0.013	0.023	0.861	0.131	0.007
13	Textile and Durables	68	-0.061	0.264	0.162	0.009	0.011	-0.002	0.857	0.111	0.031
14	Building Materials	139	0.163	0.517	0.180	0.075	0.097	-0.022	0.919	0.049	0.031
15	Paper and Packaging	35	0.016	0.657	0.210	0.034	0.058	-0.024	0.885	0.094	0.019

Table 2: Correlations

EFFICIENCY (1)	0.62	0.58	0.36	-0.36	-0.04	-0.13	0.1	0.35	0.1	0.38	0.09	0.51	0.5	0.5	0.52	0.16	
ABILITY (2)	0.61		0.25	0.49	-0.46	-0.13	0	0	0	0	0	0	0.07	0.1	0.09	0.07	
REVENUE (3)	0.55	0.16		0.58	-0.64	0.14	-0.09	-0.11	0.68	-0.21	0.33	0.24	0.64	0.45	0.31	0.34	0.26
COGSEXP (4)	0.49	0.46	0.51		-0.95	-0.21	-0.13	-0.03	0.09	-0.07	0.19	0.13	0.18	0.1	0.16	0.17	0.04
ADMINEXP (5)	-0.54	-0.38	-0.65	-0.87		-0.1	0.14	0.04	-0.12	0.05	-0.21	-0.11	-0.17	-0.13	-0.18	-0.19	-0.09
SELLINGEXP (6)	-0.04	-0.2	0.31	-0.21	-0.16		-0.04	-0.03	0.12	0.06	0.04	-0.09	-0.03	0.07	0.04	0.07	0.16
DEBT (7)	-0.04	0.05	0.09	-0.08	0.06	0.07		-0.49	0.09	-0.11	-0.26	0.05	0.09	-0.04	-0.34	-0.32	0.08
EQUITY (8)	0.06	0.04	-0.19	-0.01	0.04	-0.09	-0.35		-0.05	0.5	0.22	-0.28	-0.1	0.13	0.42	0.37	-0.03
SIZE (9)	0.31	0.05	0.69	0.11	-0.21	0.21	0.28	-0.08		-0.27	0.16	0.22	0.61	0.48	0.13	0.13	0.31
WCAP (10)	0.09	-0.06	-0.24	-0.1	0.11	-0.05	-0.3	0.47	-0.27		0.04	-0.64	-0.15	0.12	0.36	0.34	-0.03
CFO (11)	0.39	-0.02	0.36	0.19	-0.24	0.12	-0.08	0.15	0.17	0.03		0.14	0.19	0.31	0.56	0.54	0.01
FCFIND (12)	0.09	0.02	0.27	0.15	-0.15	0.04	0.19	-0.29	0.22	-0.68	0.15		0.16	0.05	0.01	0.04	0.02
REVSHARE (13)	0.56	0.16	1	0.52	-0.65	0.3	0.09	-0.18	0.68	-0.24	0.37	0.27		0.59	0.16	0.2	0.24
EARNSHARE (14)	0.56	0.14	0.59	0.22	-0.3	0.21	-0.07	0.17	0.55	0.13	0.44	0.09	0.59		0.48	0.49	0.14
ROA (15)	0.54	0.12	0.32	0.21	-0.25	0.1	-0.24	0.28	0.1	0.36	0.53	0.01	0.33	0.78		0.97	0.05
EBITDAtoTA (16)	0.60	0.33	0.53	0.76	-0.71	-0.05	-0.21	0.15	0.12	0.13	0.45	0.14	0.54	0.57	0.70		0.07
BIG4 (17)	0.14	0.07	0.23	-0.02	-0.02	0.17	0.17	-0.1	0.3	-0.05	0.01	0.02	0.23	0.17	0.05	0.09	

Winsorize cont. vars at 1st and 99th percentile

Lower Triangle is Spearman Correlation

Upper Triangle is Pearson Correlation

Table 3: Determinants of Logarithm of Firm Efficiency

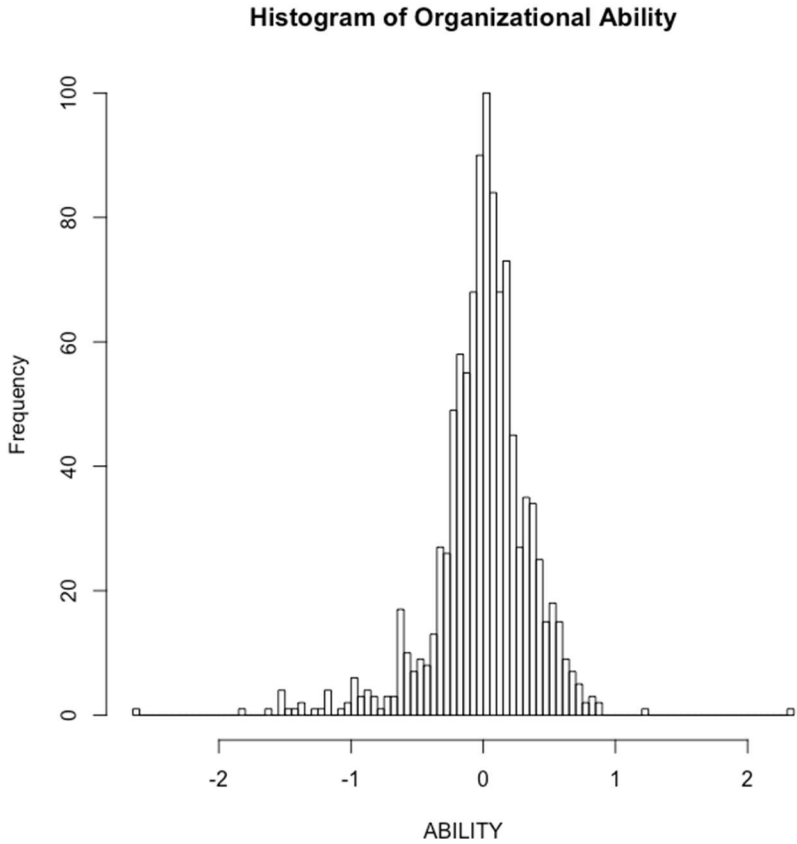
	lnEFFICIENCY
WCAP	-0.220 (0.212)
CFO	0.600*** (0.137)
INV	0.677*** (0.086)
PP&E	-0.079 (0.056)
LTASSETS	-0.413*** (0.142)
DEBT	0.132 (0.305)
EQUITY	0.494** (0.208)
EXPINT	-0.492*** (0.086)
REVINT	0.179*** (0.028)
REVSHARE	0.079*** (0.007)
FCFIND	0.093** (0.039)
SIZE	0.056*** (0.021)
<i>N</i>	1,049
R^2	0.574
Adjusted R^2	0.566

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Include year fixed effects and cluster standard errors by year.

Winsorize all continuous variables at the 1st and 99th percentile.

Figure 1



Organizational ability as residuals obtained from the model presented in Table 3.

Table 4: Persistency of Organizational Ability

	ABILITY (t+1)		ABILITY (t+2)		ABILITY (t+3)	
	(1)	(2)	(3)	(4)	(5)	(6)
ABILITY	0.704*** (0.058)		0.625*** (0.082)		0.577*** (0.094)	
HIABILITY		0.803*** (0.067)		0.771*** (0.069)		0.693*** (0.076)
LOABILITY		-0.644*** (0.123)		-0.534*** (0.141)		-0.502*** (0.178)
WCAP	0.004 (0.051)	0.011 (0.050)	0.023 (0.112)	0.036 (0.107)	0.103 (0.118)	0.120 (0.100)
CFO	0.408*** (0.039)	0.434*** (0.051)	0.271*** (0.056)	0.313*** (0.075)	0.224*** (0.069)	0.254** (0.101)
LTASSET	0.012 (0.128)	0.010 (0.127)	-0.084 (0.106)	-0.080 (0.108)	-0.095 (0.112)	-0.085 (0.109)
DEBT	0.122 (0.157)	0.109 (0.162)	0.177* (0.101)	0.156 (0.098)	0.292** (0.136)	0.273** (0.132)
EQUITY	0.014 (0.084)	-0.005 (0.090)	0.014 (0.115)	-0.019 (0.105)	-0.040 (0.082)	-0.073 (0.059)
FCFIND	0.015 (0.015)	0.018 (0.013)	0.027 (0.023)	0.030 (0.024)	0.057*** (0.007)	0.060*** (0.008)
SIZE	0.004 (0.010)	0.005 (0.010)	0.017** (0.008)	0.019** (0.008)	0.021 (0.013)	0.022* (0.013)
<i>N</i>	924	924	799	799	676	676
R ²	0.582	0.584	0.488	0.493	0.458	0.461
Adjusted R ²	0.568	0.570	0.469	0.474	0.435	0.438

Notes: * p<0.1; ** p<0.05; *** p<0.01

Include year and industry fixed effects and cluster standard errors by year

Table 5: Organizational Ability and Future Profitability

	EBITDAtoTA (t+1)	EBITDAtoTA (t+2)	ROA (t+1)	ROA (t+2)
	(1)	(2)	(3)	(4)
ABILITY	0.200*** (0.037)	0.188*** (0.039)	0.037*** (0.008)	0.038*** (0.005)
WCAP	0.048 (0.057)	0.075 (0.070)	0.154*** (0.011)	0.167*** (0.025)
CFO	0.504*** (0.054)	0.474*** (0.050)	0.330*** (0.038)	0.302*** (0.019)
LTASSET	-0.265*** (0.065)	-0.255*** (0.073)	0.035** (0.016)	0.049* (0.028)
DEBT	-0.059 (0.148)	-0.055 (0.145)	-0.182*** (0.064)	-0.176*** (0.065)
EQUITY	0.100 (0.068)	0.082 (0.070)	-0.016 (0.016)	-0.030 (0.037)
FCFIND	0.072*** (0.016)	0.086*** (0.014)	0.040*** (0.006)	0.047*** (0.007)
SIZE	0.033*** (0.003)	0.034*** (0.004)	0.009*** (0.002)	0.008*** (0.002)
<i>N</i>	924	799	924	799
R ²	0.581	0.537	0.464	0.386
Adjusted R ²	0.567	0.520	0.446	0.364

Notes: ***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Include year and industry fixed effects and cluster standard errors by year

Table 6: Determinants of Organizational Ability

	<i>Dependent variable:</i>							
	ABILITY (t)				ABILITY (t+1)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GOVOWN	-0.108*** (0.027)		-0.143*** (0.034)		-0.122*** (0.025)		-0.151*** (0.025)	
insigniGOVOWN		0.156 (0.164)		0.525* (0.268)		0.149 (0.217)		0.557* (0.312)
signiGOVOWN		-0.220** (0.108)		0.069 (0.131)		-0.170 (0.108)		0.109 (0.106)
substGOVOWN		-0.102*** (0.029)		-0.129*** (0.037)		-0.116*** (0.028)		-0.135*** (0.032)
BIG4	-0.010 (0.040)	-0.009 (0.039)	-0.043 (0.040)	0.008 (0.044)	0.014 (0.034)	0.015 (0.033)	-0.013 (0.032)	0.041 (0.037)
GOVOWN*BIG4			0.161*** (0.045)				0.134*** (0.040)	
insigniGOVOWN*BIG4				-0.817*** (0.312)				-0.937*** (0.340)
signiGOVOWN*BIG4				-0.878*** (0.181)				-0.843*** (0.220)
substGOVOWN*BIG4				0.236*** (0.057)				0.199*** (0.049)
WCAP	-0.058 (0.217)	-0.049 (0.222)	-0.172 (0.245)	-0.229 (0.269)	-0.116 (0.183)	-0.109 (0.187)	-0.231 (0.209)	-0.301 (0.247)
CFO	-0.001 (0.123)	-0.0004 (0.122)	-0.017 (0.126)	-0.030 (0.123)	0.382*** (0.084)	0.379*** (0.086)	0.368*** (0.087)	0.358*** (0.085)
LTASSET	-0.047 (0.199)	-0.044 (0.196)	-0.155 (0.222)	-0.249 (0.236)	-0.087 (0.248)	-0.080 (0.250)	-0.196 (0.268)	-0.297 (0.299)
DEBT	0.297 (0.259)	0.296 (0.261)	0.373 (0.277)	0.483 (0.313)	0.415 (0.344)	0.416 (0.345)	0.494 (0.349)	0.610 (0.375)
EQUITY	0.116 (0.231)	0.107 (0.233)	0.216 (0.256)	0.284 (0.280)	0.173 (0.222)	0.165 (0.224)	0.277 (0.238)	0.350 (0.275)
FCFIND	0.003 (0.037)	0.008 (0.039)	0.002 (0.037)	0.015 (0.036)	0.013 (0.025)	0.017 (0.027)	0.013 (0.026)	0.023 (0.023)
SIZE	-0.002 (0.016)	-0.002 (0.015)	0.0002 (0.016)	-0.001 (0.015)	-0.002 (0.011)	-0.004 (0.011)	-0.001 (0.011)	-0.003 (0.011)
Observations	1,049	1,049	1,049	1,049	924	924	924	924

R ²	0.143	0.145	0.145	0.169	0.178	0.179	0.179	0.202
Adjusted R ²	0.117	0.117	0.118	0.140	0.150	0.150	0.151	0.171

Note: *p<0.1; **p<0.05; ***p<0.01

Include year and industry fixed effects and cluster standard errors by year

Table 7: Profitability: Organizational Ability, Government Ownership, and Auditor Role

	<i>Dependent variable:</i>	
	leadROA	
	(1)	(2)
ABILITY	0.039*** (0.008)	0.027*** (0.008)
insigniGOVOWN	0.043 (0.047)	0.045 (0.048)
signiGOVOWN	0.014 (0.024)	0.022 (0.023)
substGOVOWN	0.027** (0.011)	0.030*** (0.011)
BIG4	0.016*** (0.004)	0.018*** (0.004)
ABILITY*insigniGOVOWN		-0.038 (0.106)
ABILITY*signiGOVOWN		0.173*** (0.049)
ABILITY*substGOVOWN		0.054*** (0.012)
ABILITY*BIG4		-0.008 (0.017)
WCAP	0.148*** (0.014)	0.149*** (0.015)
CFO	0.326*** (0.040)	0.317*** (0.038)
LTASSET	0.031 (0.025)	0.027 (0.032)
DEBT	-0.177** (0.069)	-0.179*** (0.068)
EQUITY	-0.005 (0.022)	-0.003 (0.025)
FCFIND	0.043*** (0.007)	0.044*** (0.007)
SIZE	0.006*** (0.002)	0.006*** (0.002)

Observations	924	924
R ²	0.471	0.477
Adjusted R ²	0.451	0.455

Note: *p<0.1; **p<0.05; ***p<0.01; Include year and industry fixed effects and cluster standard errors by year