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Corporate Performance in Transition: The Role of Business Constrains and Institutions in the South Mediterranean Region

"B. Business environmental constraints in MENA countries with a special focus on Egypt"

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CORPORATE PERFORMANCE IN TRANSITION: THE ROLE OF BUSINESS CONSTRAINS AND INSTITUTIONS IN THE SOUTH MEDITERRANEAN REGION

(FEMISE grant No FEM41-08)

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Note: The report comprises three single articles. This is the second article entitled:

"B. Business environmental constraints in MENA countries with a special focus on Egypt"

Executive Summary

This report aims at analyzing the recent trends in corporate performance and economic success in Southern Mediterranean countries at the firm and country level. More specifically, it aims at identifying and evaluating the potential factors that may trigger and foster economic changes in the region, focusing in particular on the role played by skill constraints, the business environment and the institutional setting in explaining economic performance, measured as productivity, sales growth rates and exports, as well as quantifying their relative importance. Firstly, we investigate different sources of economic performance steaming from factors that are internal and external to the firm. At the firm level, the business environment encompasses features relative to the work force, legal, regulatory, financial, and institutional system of a country and therefore it has an impact on the performance of firms and industries.

Secondly, since the business environment affects firms and country performance, then we proceed with an empirical investigation at the country level as well. The common underlying assumption is that firms and countries facing 'better' business environments and institutions can be expected to perform better.

The main novelty of this report is to produce empirical evidence covering the transition period on the conditions that influence private sector performance and country level exports in the South Mediterranean region in comparison to other regions/countries that also went through an economic and institutional transition in the past. As a result, the study provides the tools for designing appropriate development policies.

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This report is structured into three parts: the first part focuses on skills and resource characteristics of firms and the role of the main perceived constrains to do business at the firm level. Micro survey data is used to explore the impact of labor skills and other firm-specific characteristics on firm performance, measured as sales growth rates, in 135 developing countries. The analysis uses a consistent and large data set from the World Bank's Enterprise Surveys. The results show that labor skills and firm-specific characteristics are significant predictors of firms' performance. However, the predictive power of labor skills and the firm-specific characteristics is significantly affected by national economic and non-economic factors. Indeed, the national levels of economic, financial and human development as well as income inequality, along with domestic conditions of regulatory governance and other institutions as well as legal and social heterogeneity, all have a role to play in determining firms' performance. The results show that the classification of firms as labor skill-constrained or not in developing countries can be better assessed on the basis of both micro-level and macro-level factors.

The second part of the report specifically focus on the main obstacles that MENA firms, and in particular Egyptian enterprises, face to do business in their country and investigates to what extent the constraints affect firm performance. Firm's performance is measured as Total Factor Productivity (TFP) and labour productivity (LP). Our analysis evaluates the effects of the different business indicators, obtained from the World Bank Enterprise Survey using firm level data from manufacturing firms, on TFP/LP. A number of control variables commonly used in the empirical literature are also included in the model. The main results indicate that access and cost to finance, tax rates, regulatory policy uncertainty, the price of land and basic infrastructures, such as access to water and electricity, are among the most relevant factors for Egypt. These findings have important policy implications, in particular for policy makers and will help them decide what sort of specific actions can be taken to reduce the main obstacles and consequently to pave the way for manufacturing Egyptian firms to become more competitive. The analysis is also extended to other countries in the region, namely Lebanon, Jordan, Morocco and Tunisia and the environmental constrains before and after the Arab Spring are compared. The main findings indicate that regulatory and policy uncertainty, corruption and crime have become more important obstacles after 2011 for most firms in these countries.

The third part focuses on the country-level analysis and investigates the role of the quality of institutions and its different dimensions in the selected countries in explaining export performance. It aims at analysing whether higher quality of economic governance rewards economy performance and facilitates the integration of the MENA region in the world economy. A gravity model of trade augmented with governance indicators is estimated using bilateral exports among 189 trading partners and also for 19 MENA exporters over the period from 1996 to 2013. The main results show that, individually, each of the six governance indicators in the exporting and the importing countries considered has a positive effect on bilateral trade. However, the results for MENA exporters slightly differ. Governance in the importing countries seems to be less relevant for MENA exporters than for the rest of exporters. The effect of country pair similarity in governance indicators indicate similar levels of regulatory quality and the rule of law in exporter and importer countries favours exports of MENA countries. Similarities in voice and accountability also foster exports in the average exporter, but it does not seem relevant for MENA exporters.

Résumé

Ce rapport vise à analyser les tendances récentes de la performance de l'entreprise et le succès économique dans les pays situés au Sud de la Méditerranée au niveau de l'entreprise et du pays. Plus précisément, il vise à identifier et évaluer les facteurs potentiels qui peuvent déclencher et favoriser les changements économiques dans la région, tout en mettant l'accent sur le rôle joué par l'environnement commercial et le cadre institutionnel pour expliquer la performance économique, mesurée par la productivité, la croissance des ventes et les exportations, ainsi que de quantifier leur importance relative. Tout d'abord, nous étudions les différentes sources de la performance économique à partir des facteurs internes et externes à l'entreprise. Au niveau de l'entreprise, l'environnement commercial englobe les caractéristiques du système juridique, réglementaire, financier et institutionnel d'un pays et, par conséquent, il a un impact sur la performance des entreprises et des industries.

Deuxièmement, étant donné que l'environnement commercial affecte la performance des entreprises et des pays, donc, nous procédons à une enquête empirique de ces conjectures au niveau des pays aussi. L'hypothèse sous-jacente commune est que les entreprises et les pays exposés à de «meilleurs» environnements et institutions commerciaux peuvent être tenus d'accomplir mieux.

La principale nouveauté de ce rapport est de développer des données empiriques portant sur la période de transition sur les conditions qui influent la performance du secteur privé et au niveau des pays exportateurs dans la région sud de la Méditerranée par rapport à d'autres régions/pays qui avaient déjà passé par une transition économique et institutionnelle dans le passé. En conséquence, l'étude fournit les outils pour construire les politiques de développement appropriées.

Ce rapport est structuré en trois parties: la première partie se concentre sur les compétences et les caractéristiques des ressources des entreprises et le rôle des principales contraintes perçues pour faire du commerce au niveau de l'entreprise. Des micro données d'enquête sont utilisées pour explorer l'impact des compétences de la main-d'œuvre et d'autres caractéristiques propres à l'entreprise sur sa performance, mesurée par la croissance des ventes, dans 135 pays en voie de développement. L'analyse utilise un ensemble de données cohérentes et grandes à partir des enquêtes auprès des entreprises de la Banque mondiale. Les résultats montrent que les compétences de la main-d'œuvre et des caractéristiques propres à l'entreprise sont des prédicteurs significatifs de la performance des entreprises. Cependant, le pouvoir prédictif des compétences de la main-d'œuvre et des caractéristiques propres à l'entreprise est affecté de manière significative par des facteurs nationaux économiques et non-économiques. En effet, les niveaux nationaux de développement économique, financier et humain, l'inégalité des revenus, les conditions internes de gouvernance réglementaire et d'autres institutions ainsi que l'hétérogénéité juridique et sociale, ont tous un rôle à jouer dans la détermination de la performance des entreprises. Les résultats montrent que la classification des entreprises par les compétences limitées de la main d'œuvre ou leur absence dans les pays en voie de développement peut être mieux évaluée sur la base de facteurs à la fois aux niveaux micro et macro.

La deuxième partie du rapport se concentrer spécifiquement sur les principaux obstacles les entreprises de la région MENA, et notamment les entreprises égyptiennes face afin de réaliser des activités commerciales dans leur pays et examine dans quelle mesure ces contraintes affectent-elles la performance des entreprises. La performance de la firme

est mesurée en productivité totale des facteurs (PTF). Notre analyse évalue les effets des différents indicateurs d'activité, obtenus à partir de l'Enquête sur l'entreprise de la Banque mondiale en utilisant des données au niveau des entreprises d'entreprises manufacturières, sur la PTF. Un certain nombre de variables de contrôle utilisées couramment dans la littérature empirique sont également inclus dans le modèle. Pour vérifier la robustesse de nos résultats, des mesures alternatives de rendement de l'entreprise sont utilisées, tels que les ventes totales et le nombre moyen de travailleurs. Les principaux résultats indiquent que l'accès et le coût de financement, les taux d'imposition, la politique d'incertitude réglementaire, le prix des terrains et des infrastructures de base, comme l'accès à l'eau et l'électricité, sont parmi les facteurs les plus pertinents. Ces résultats ont des implications politiques importantes, en particulier pour les créateurs de politiques et les aideront à décider du type d'actions spécifiques qui pourront être prises afin de réduire les principaux obstacles et par conséquent à encourager les entreprises manufacturières égyptiennes à devenir plus compétitives. L'analyse est également étendue à d'autres pays de la région, à savoir le Liban, la Jordanie, le Maroc et la Tunisie et les contraintes environnementales avant et après le printemps arabe sont comparées. Les principaux résultats indiquent que l'incertitude réglementaire et politique, la corruption et la criminalité sont devenues des obstacles plus aggravés après 2011 pour la plupart des entreprises de ces pays.

La troisième partie porte sur l'analyse au niveau des pays et étudie le rôle de la qualité des institutions et de ses différentes dimensions dans les pays sélectionnés pour expliquer la performance de l'exportation. Elle vise à analyser si une meilleure qualité de gouvernance économique récompense la performance de l'économie et facilite l'intégration de la région MENA dans l'économie mondiale. Un modèle de gravité du commerce accompagné par des indicateurs de gouvernance est estimé à l'aide des exportations bilatérales entre 189 partenaires commerciaux et également 19 MENA exportateurs au cours de la période de 1996 à 2013. Les principaux résultats montrent que, individuellement, chacun des six indicateurs de gouvernance dans les pays exportateurs et importateurs considérés ont un effet positif sur le commerce bilatéral. Cependant, les résultats pour la région MENA exportateur diffèrent légèrement. La gouvernance dans les pays importateurs semble moins pertinente pour les exportateurs de la région MENA que pour le reste des exportateurs. L'effet de similitude des pays par paire dans les indicateurs de gouvernance indiquent des niveaux similaires dans la qualité de la réglementation et la primauté du droit dans les pays exportateurs et importateurs favorise les exportations des pays de la région MENA. Similitudes dans la voix et la responsabilité de même favorisent des exportations dans les pays exportateurs en moyenne, mais cela ne semble pas pertinent pour les exportateurs de la région MENA.

The report comprises three single articles:

A. Labor skills, institutions and firm performance in developing countries

B. Business environmental constraints in MENA countries with a special focus on Egypt

C. Exports and governance: Is MENA different?

B: Business environmental constraints in MENA countries with a special focus on Egypt

1. Introduction

Since the Egyptian revolution in 2011, Egypt has been involved in a major political and social transitional period, which initial aim was to generate economic and social opportunities that paved the way towards economic growth and employment growth. However, the process has been plagued with difficulties and political hindrances generating additional constrains and increasing political uncertainty. Hence, Egypt still faces important structural challenges that impede a smooth development of private activities. The country has been strongly based on a traditional system ruled by governmental intervention, which prevented the well-functioning of economic incentives and hindered development in the past. Nowadays, Egypt is facing as a major challenge to pave the way to improve its past trends and create new economic opportunities. In this frame, identifying the biggest constrains that difficult operations and growth of Egyptian firms is an important objective. Similarly, other MENA countries have also gone through important political and social transitions and the analysis of the main constraints faced by the business sector in those countries is of major importance for policy makers. Institutional and economic conditions are an important determinant of economic development and growth at a country level. Moreover, since firms' performance is usually the motor of economic growth, a better understanding of firms growth processes is needed, as well as to find out what are the most suitable policies to support the business environment and eventually generate employment growth.

From a theoretical perspective, the business environment has an impact on a firm productivity (national and foreign owned) due to the fact that its investment decisions are affected by this business environment. It is important to highlight that the factors than constitute this environment could affect investment firm's decisions in several ways, depending on the sector and industry to which the firm belong, its size, location, and ownership among other factors. As indicated by Augier et al (2012), the use of firm level data instead of country level data allow us to analyse the impact of the business

environment on a firm productivity in a better way, by enabling us to control for firm heterogeneity.

There are in the related literature numerous theoretical and empirical studies focused on firm productivity and its determinants. As such this paper builds on the empirical literature by investigating the role of the business and institutional environment in determining differences in TFP (Total Factor Productivity) and labour productivity of Egyptian manufactured firms and compare the results with those found for other MENA countries for which comparable firm-level data are available before and after the Arab Spring. Previous research highlights the fact that firm productivity is affected by different factors. In particular, Amiti and Konings (2007) and De Loecker (2007) focus on trade liberalization as a driver of firm-level productivity.

A number of recent studies have used firm-level productivity as a measure of firm performance to analyse the effect of a number of business environment factors, e.g. Augier et al (2012), Kinda et al (2011), Hallward-Driemeier et al (2006) and Dollar et al (2006). Other authors focused instead on labour market variables, for example employment growth e.g. Hallward-Driemeier et al (2006), Dinh et al (2010) or Aterido et al (2011). The use of alternative measures of firm performance have mainly been considered when analysing some developing countries, for which it is difficult to find the required data to obtain total factor productivity. In this line, Hallward-Driemeier et al (2006) used sales growth and investment rate as main proxies for firm performance.

To our knowledge, Augier et al (2012) and Kinda et al (2011) are the only authors focusing on Middle East and North African (MENA) countries to analyse the impact of business environment constraints on firm productivity. More specifically, Augier et al (2012), using data from manufacturing Moroccan firms from the period 1997 to 2004, analysed the effects of two dimensions of business environment on firm performance of Moroccan firms. The authors investigate the effect of finance factors on TFP and also other types of business obstacles like taxes, administrative constraints and water outages. Their results indicate that finance and taxes are the main obstacles affecting the TFP on Moroccan companies. The paper also examines how differences between firm characteristics affect the different obstacles and finds that for lager firms and exporting companies that are foreign owned financial indicators are a less important obstacle than for small firms and for non exporters. Finally, Kinda et al (2011) analyse firm

productive performance in Morocco, Saudi Arabia, Algeria, Egypt and Lebanon and compare it with seventeen other developing countries. They also analyse the impact of different Investment Climate (IC) indicators on firm productivity. Their data comes from the World Bank Investment Climate Assessment (ICA) and they use only four categories out of the seven available to analyse to what extent the quality of the infrastructure, business-government relations, financing constraints and human capacity matter for firm productivity. Their results show that the level of education of workers, overdraft facility and access to internet are the most important determinants of firm performance and that metal and machinery industry and textiles and garments are the sectors most affected from the business environmental constrains.

The main contribution of our paper to the existent literature is the identification of business environment constraints in MENA countries in the 2000s, and in particular for Egyptian firm's productivity, using firm-level data. The main results could be used to extract some policy recommendations in a historical period in which the country is involved in an important process of economic, social and political change.

The paper is structured as follows: Section 2 describes the data and the methodology used to obtain total factor productivity for Egypt. In Section 3 we analyse the most important obstacles declared by Egyptian firms and investigate how differences in firm's characteristics affect the perception of each business environment variable as an obstacle. Section 4 presents the econometric model used to determine the impact of business environmental constraints on firms performance and outlines the main results. Section 5 compares business obstacles in Egypt before and after the 2011 Revolution. A Comparison with other MENA countries before and after the Arab spring is presented in Section 6. Finally, conclusions are presented in Section 7.

2. Data description and TPF estimation for Egyptian firms

2.1. Data sources

Data on Egyptian firms are obtained from the World Bank Enterprise Survey dataset. The data comes from a firm-level survey based on a representative sample of manufacturing Egyptian firms classified using ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1). Formal (registered) companies with 5 or more employees are targeted for interviews and firms with 100% government/state ownership are not eligible to participate in the Enterprise Survey. In general, business owners and top

managers were interviewed, but sometimes the survey respondent calls company accountants and human resource managers into the interview to answer questions concerning the sales and labour sections of the survey. The questionnaire covers a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures. Typically, 1200-1800 interviews are conducted in larger economies, 360 interviews in medium-sized economies, and only 150 interviews in small economies[1]. The Egyptian dataset includes 3,129 firms for the years 2004, 2005 and 2007. For some variables, namely sales, exporting and importing status we are able to use information for an additional year per questionnaire, since each firm is asked in the questionnaire for the value of sales and the export/import status not only in the current but also in the previous year. Some firms are only included in one or two waves, whereas 554 firms are included in the three questionnaires. Hence, using the available information for these firms we build a panel dataset from 2003 to 2007 obtaining 2,770 observations, after dropping 34 firms, which declared that the average number of workers was less than five. We disregarded these firms for consistence, because according to the Enterprise World Bank methodology, only firms with 5 or more employees are targeted.

The data set includes also information about the investment climate constraints to Egyptian firms. To measure the investment climate constraints of the firms, we use data measuring the obstacles that firms identify as the main constrains for its operations and growth of their business. Respondents rank twenty-two obstacles within a scale from 0 to 4, where 0 means "No obstacle" and 4 is the maximum value meaning "very severe obstacle". Table A.1 in the Appendix presents a detailed description of the variables.

2.2. Firm performance measures

As main measure of firm performance we use TFP of the firm. To calculate TFP we obtain estimates of a traditional Cobb-Douglas production function. The Cobb-Douglas production function is given by:

$$ln\, sales_{it} = \beta_0 + \beta_l\, ln\, labour_{it} + \beta_k \quad ln\, capital_{it} + \beta_m \quad ln\, materials_{it} + \omega_{it} + \eta_{it} \quad (1)$$

[1] See World Bank (2012) for more details.

where *ln* denotes natural logarithms, $sales_{it}$ is total sales of firm *i* in year *t*, in thousands of Egyptian pounds . As independent variables we include $labour_{it}$ defined as the average number of permanent workers, $materials_{it}$ denotes the total purchases of raw materials and intermediate goods, $capital_{it}$ denotes the total fixed tangible assets of the firm and the error term id discomposed into two terms: ω_{it}, which indicates productivity socks and an i.i.d. component given by η_{it}. We deflate firm-level sales and input expenditures using the industry level production price index for manufactures with 2005 as base year, the data comes from the International Financial Statistics (IFS and UN) for manufacturing.

Consistent and unbiased estimates of the production function are used to obtain unbiased estimates of TFP, which is computed as the residual of the estimated production function. We make use of the available methodologies to deal with different biases that have been identified in the related literature and might affect the estimates of TFP. In particular, we follow Van Beveren (2012)[2] to select a number of alternative estimates of the coefficients of the production function used to obtain TFP that overcome the abovementioned biases (Table 1).

Column 1 in Table 1 shows the classical OLS estimates, only for comparative purposes, since they are subject to endogeneity and selection biases. In column 2 the model is estimated controlling for time-invariant unobserved heterogeneity with firm-specific effects. The third alternative, (column 3), proposed by Levisohn and Petrin (2003), make use of inputs to control for unobservable factors. Finally, column 4 shows the coefficients estimated by using the three- steep procedure proposed by Olley and Pakes (1996). In the first steep the unobserved productivity is obtained for each firm using their level of investment, in the second step the survival probability of the firm is estimated and the last steep employs the outcomes of the previous two steps to control for simultaneity and selection biases. We decided to use TFP estimated using the Levisohn and Petrin (2003) as independent variable for our models because this methodology control for two important biases, namely simultaneity bias and

[2] For a review of the available estimation techniques see Van Beveren (2012).

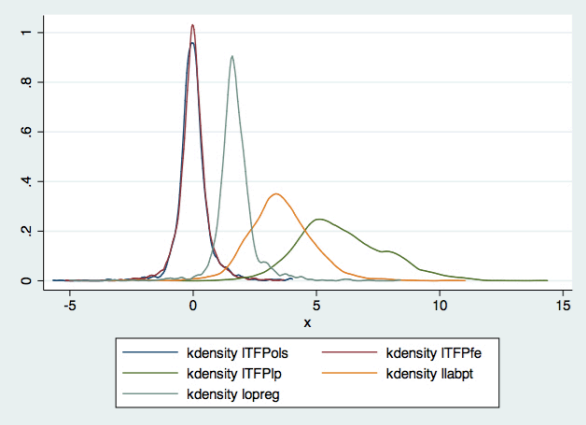
measurement error, since data availability do not allow us to obtain accurate values of firm investment.

Table. 1. Product function estimates

	OLS	FE	LEV reg	OP reg
Ln Capital$_{i,t}$	0.085***	0.081***	0.055***	0.081***
	(0.011)	(0.012)	0.010	(0.029)
Ln Labour $_{i,t}$	0.350***	0.372***	0.363***	0.606***
	(0.020)	(0.025)	0.019	(0.042)
Ln Materials $_{i,t}$	0.603***	0.611***	0.608***	0.315***
	(0.012)	(0.014)	0.012	(0.043)
Number of Obs.	2429	2429	2429	2480

Note: where OLS denotes Ordinary Least Squares, FE denotes OLS fixed effects, LEV denotes, Levinsohn and Petrin, and OP denotes Olley and Pakes. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Figure 1. Kernel Density for each TFP and for



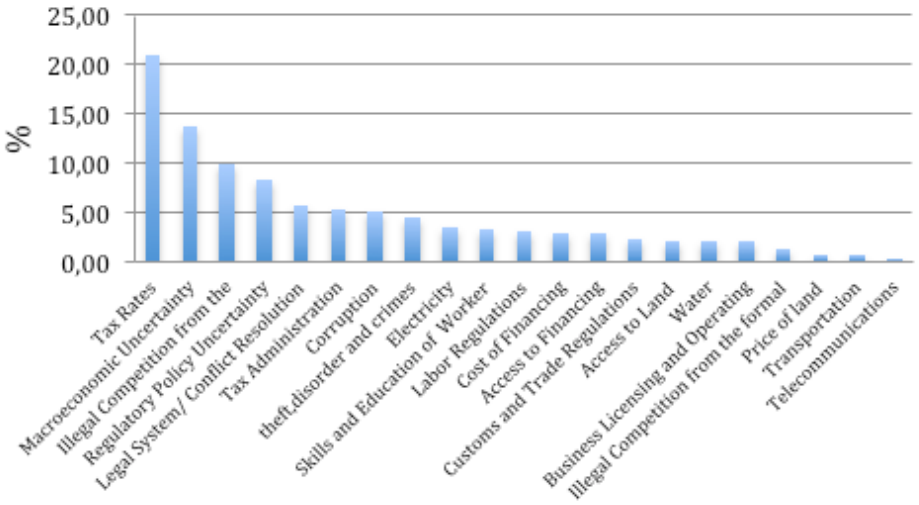
Note: where l denotes natural logs, TFP denotes Total Factor Productivity, TFPols denotes the corresponding Ordinary Least Squares estimate, TFPfe denotes the fixed effects estimate, lp denotes Levinsohn and Petrin, and opreg denotes Olley and Pakes estimate and labpt denotes labour productivity measured as sales per worker.

3. Measuring the most important obstacles for Egyptian firms

In order to identify the main obstacles that affect operations and growth of Egyptian companies, we use firm's answers in each questionnaire, and obtain the average value per each constrain and year. Questions related with the business environment are only available in the current year for each questionnaire, for this reason we can only

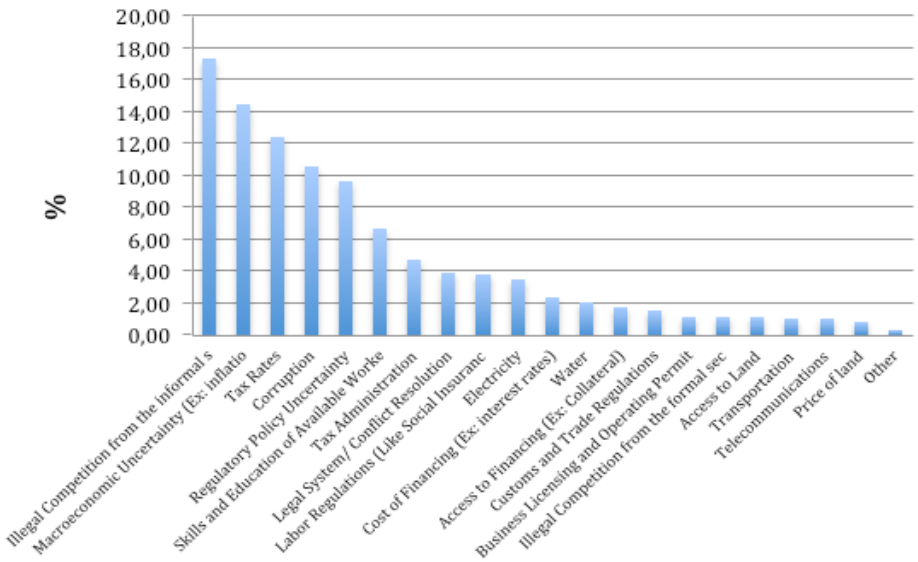
construct explanatory variables for the years 2004, 2005 and 2007, in which the surveys have been conducted.

Figure 2. Main obstacles quoted by Egyptian firms in 2004



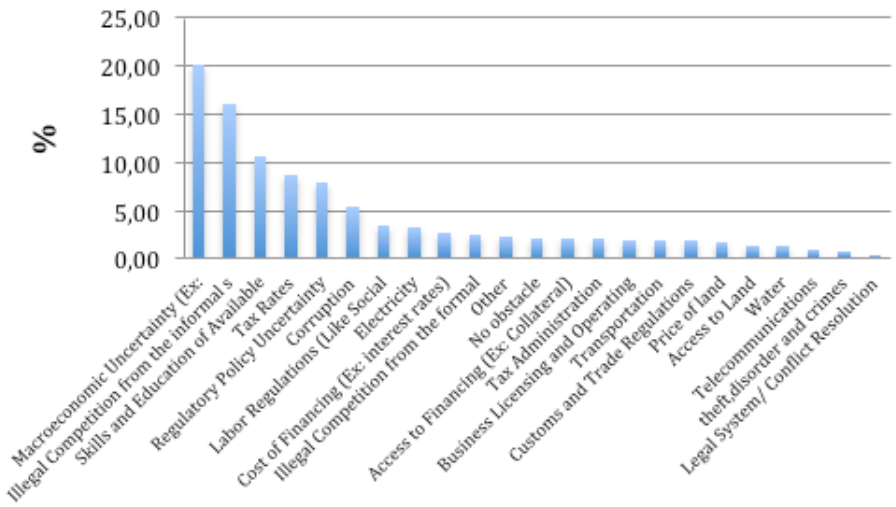
Source: World Bank Enterprise Survey; Author calculations

Figure 3. Main obstacles quoted by Egyptian firms in 2007



Source: World Bank Enterprise Survey; Author calculations

Figure 4. Main obstacles quoted by Egyptian firms in 2013



Source: World Bank Enterprise Survey; Author calculations

Figures 2-4 show the main obstacles declared by firms in 2004, 2007 and 2013, respectively. As we can observe that the main obstacles identified by Egyptian firms are related with tax rates, macroeconomic uncertainty, illegal competition, and the regulatory policy uncertainty. Corruption became more important in 2007 than in 2005 and skills and education of available workers is gaining importance over time. In 2013, the most quoted factor is macroeconomic uncertainty, with 20 percent of the firms naming it.

It is important to notice that firm response concerning the biggest obstacles may be affected by firm's characteristics and some obstacles may be more important for small than for larger firms or for domestic rather than for foreign firms. Hence, we examine how each obstacle varies across the different types of firms. We estimate an OLS regression to show simple correlations between the different obstacles and some firm's characteristics. The model estimated is given by:

$$IC_{i,t} = \beta_0 + \beta_1 \text{MEs}_{it} + \beta_2 \text{LGs}_{it} + \beta_3 \exp_{it} + \beta_4 \text{fore}_{it} + \delta_k + \gamma_t + \varepsilon_{it} \quad (2)$$

where IC_{it} denotes each of the 22 obstacles identified in the questionnaires and takes values from 0 to 4. MEs_{it} is a dummy variable taking value 1 if firm employs between 50 and 500 employees and zero otherwise. LGs_{it} is a dummy variable taking value of 1 if firm employ more than 500 employees and zero otherwise and the omitted category

for firm size is SMs_{it} taking value 1 for firms than employ between 5 and 50 employees. We also include as firm characteristics those that affect the perception of the different obstacles: whether firms are exporters or not, including $exp_{i,t}$ as a dummy variable that takes value of 1 when a firm exports more than 10 percent of their total sales. $fore_{i,t}$, takes value of 1 if firm is owned by foreigners and zero otherwise and we include industry dummies, δ_k. We are not able to control for firm location because data are not reliable.

Table 2. Firm size, firm characteristics and business environmental obstacles

Dep. Var:	Crime	Other	Laws	Ilegcomfor	Ilegalcominf	Corrupt	Macro	Finanacc	Financost	Licence	Skills
Explanatory Var:											
MEs	-0.051	-0.242**	-0.068	-0.182	-0.274***	-0.138	0.094	-0.416**	-0.394**	-0.107	-0.013
	0.083	0.112	0.108	0.125	0.100	0.092	0.082	0.163	0.162	0.082	0.097
LGs	-0.076	-0.662***	-0.242*	0.064	-0.036	-0.002	0.062	-0.229	-0.329	-0.049	0.135
	0.097	0.139	0.133	0.146	0.124	0.114	0.101	0.211	0.211	0.101	0.119
Exp	0.069	0.342***	0.173	-0.125	-0.022	0.019	-0.019	0.055	0.105	-0.101	-0.083
	0.090	0.119	0.114	0.135	0.104	0.098	0.086	0.169	0.170	0.085	0.101
Fore	-0.022	0.058	-0.191	-0.055	0.126	-0.071	-0.274	-0.687*	-0.946***	0.070	0.095
	0.164	0.228	0.226	0.248	0.210	0.189	0.169	0.367	0.359	0.170	0.201
obs	1028	2486	2529	1020	2549	2566	2566	1928	1935	2573	2575
rmse	0.887	1.889	1.740	1.305	1.543	1.542	1.333	2.045	2.075	1.301	1.550

Dep. Var:	Laborreg	Customs	Taxadm	Taxrate	Policy	Landpr	Landacc	Water	Transport	Electr	Telec
Explanatory Var:											
MEs	-0.100	-0.439***	-0.166*	-0.246***	-0.185*	-0.254*	-0.272*	-0.149	-0.022	0.062	-0.093
	0.089	0.159	0.101	0.093	0.096	0.148	0.142	0.120	0.068	0.087	0.060
LGs	0.044	-0.724***	-0.368***	-0.381***	-0.293**	-0.159	-0.168	-0.264*	0.152*	0.040	-0.028
	0.110	0.206	0.124	0.115	0.119	0.188	0.177	0.151	0.084	0.107	0.074
Exp	0.051	0.663***	0.169	0.234**	0.021	-0.050	-0.113	-0.019	-0.110	-0.084	0.176***
	0.093	0.166	0.107	0.100	0.101	0.152	0.148	0.124	0.071	0.089	0.062
Fore	0.173	-0.174	-0.234	-0.264	-0.015	-0.392	-0.490	0.197	-0.047	-0.124	0.018
	0.184	0.347	0.211	0.196	0.200	0.320	0.304	0.256	0.141	0.183	0.126
obs	2577	2061	2554	2557	2552	2158	2284	2374	2572	2579	2564
rmse	1.437	2.107	1.646	1.601	1.548	2.054	2.047	1.769	1.081	1.336	.922

Notes: Each column uses a different business environmental obstacle as dependent variable. Robust standard errors are in brackets, *** p<0.001, **p<0.05, * p<0.01. Industry and year dummies are included in all models. The omitted category for firm size is SMs, which takes value 1 if firm have between 5 and 50 workers. See Table A.1 for the definition of the dependent variables.

Table 2 shows the results obtained from estimating specification (2). We observe that the effect of firm size varies across business environmental obstacles. Not surprisingly, there are a number of obstacles that constrain medium and large firms less than small firms. These are for example, the legal system, water and transport constrains, for which large firms are less constrained than small firms. As regards medium firms, they are less constrained than small firms by illegal competition from the informal sector, access and cost of finance and access and price of land. The obstacles that are more affected by small size of the firms are customs, tax administration, tax rates and the regulatory

policy uncertainty. In addition, exporters identify customs, tax rates and telecommunications as important constraints to their business. Since these obstacles are related with internationalization activities the results are as expected. Finally, firms owned by foreigners give less importance than domestic firms to constraints related to access and cost of finance. Results are comparable to those obtained by Augier et al (2012) and Aterido et al (2011).

4. Business environmental constraints and firms performance. The Egyptian case

4.1. Empirical strategy

In order to investigate how the business and institutional environment affect firm performance of Egyptian firms, we estimate the following equation:

$$lY_{it} = \beta_0 + \beta_1 IC_{i,2004} + \beta_2 lworkt_{i,t-2} + \beta_3 fore_{it} + \delta_k + \gamma_t + \epsilon_{it} \quad (3)$$

where lY_{it} denotes the current TFP level in logs, $IC_{i,2004}$ refers to a given obstacle perceived by firms in the initial year 2004, $lworkt_{i,t-2}$ is the lagged number of workers in t-2 in logarithms. and $fore_{i,t}$ is a dummy variable that takes the value of 1 when a firm is owned by foreigners and zero otherwise. Industry (δ_k) and time dummies (γ_t) have also been included in the model to proxy for factors that are industry specific and time-invariant, and factors that vary over time and are common to all firms.

We test whether and to what extent the obstacles perceived by firms in the initial year 2004 of our panel impact firms performance (proxied with TFP). TFP has been obtained using Levinsohn and Petrin (2003) methodology as explained in the previous section and it is included in natural logarithms. To avoid multicolinearity we follow a sequential estimation and include each obstacle (IC) one by one in the model. We have 22 different ICs: tel, elec, trans, water, landacc, landpr, policy, taxrate taxadm, customs, laborreg, skills, licence, fincost, finacc, macroe, corrupt, ilegalcom_info, ilegalcom_for, laws, crime and other constrains.[3] Equation (3) is estimated using panel estimation techniques[4].

[3] See Appendix for a detailed description of each variable.

[4] *xtreg* command in Stata14.

4.2.Main results

Table 3 shows the results obtained from specification (3). The main results show the effect of each business environmental variable on the firm total factor productivity. The first column contains estimated coefficients for each individual business environmental constrain, second and third columns show estimated coefficients for the control variables (average number of workers in t-2 and a dummy variable indicating foreigner ownership). As we can observe, access and cost of finance have a negative and statistically significant impact on firm total factor productivity. We also obtain that tax rates, regulatory policy uncertainty, land price, water and electricity constrains have a negative impact on TFP. By comparing these results with those obtained in Table 2, the main obstacles reported by firms, we observe that only tax rates and regulatory policy uncertainty were reported as important obstacles, while the rest: water, electricity, price of land, tax rates, and regulatory policy uncertainty were only reported by few firms as a biggest obstacles.

Table 3. Impact of Business Obstacles on TFP

	Business				
Dependent variable: TFP	Obstacle	Firm Charactics:		Regression diagnostics	
IC name	IC coeff	lworkt_2	Foreign owner	obs	rho
Other	-0.012	0.397***	0.022***		
	(0.024)	(0.039)	(0.004)	1,486	.3305
Laws	-0.031	0.399***	0.021***		
	(0.023)	(0.039)	(0.004)	1,480	.3296
Ilegalcominf	0.005	0.402***	0.022***		
	(0.029)	(0.039)	(0.004)	1,483	.3296
Ilegalcomfor	0.005	0.402***	0.022***		
	(0.029)	(0.039)	(0.004)	1,483	.3296
Corrupt	-0.016	0.398***	0.022***		
	(0.032)	(0.039)	(0.004)	1,489	.3293
Macro	0.019	0.397***	0.022***		
	(0.037)	(0.039)	(0.004)	1,492	.3296
Finanacc	-0.062***	0.392***	0.021***		
	(0.019)	(0.039)	(0.004)	1,488	.3235
Financost	-0.047**	0.391***	0.021***		
	(0.020)	(0.039)	(0.004)	1,488	.3271
Licence	-0.052	0.393***	0.022***		
	(0.035)	(0.039)	(0.004)	1,492	.3283
Skills	-0.049	0.396***	0.022***		
	(0.034)	(0.039)	(0.004)	1,489	.3288
Laborreg	0.018	0.399***	0.021***		
	(0.035)	(0.039)	(0.004)	1,492	.3295
Customs	-0.024	0.395***	0.021***		
	(0.019)	(0.039)	(0.004)	1,492	.3283
Taxadm	-0.022	0.399***	0.022***		
	(0.031)	(0.039)	(0.004)	1,488	.3343

Taxrate	-0.072*	0.397***	0.021***		
	(0.039)	(0.039)	(0.004)	1,492	.3269
Policy	-0.067**	0.388***	0.022***		
	(0.032)	(0.039)	(0.004)	1,486	.3260
Landpr	-0.033*	0.395***	0.021***		
	(0.020)	(0.039)	(0.004)	1,486	.3267
Landacc	-0.027	0.395***	0.021***		
	(0.019)	(0.039)	(0.004)	1,489	.3280
Water	-0.055***	0.391***	0.021***		
	(0.021)	(0.039)	(0.004)	1,492	.3247
Transport	-0.058	0.396***	0.021***		
	(0.047)	(0.039)	(0.004)	1,483	.3282
Electr	-0.081**	0.395***	0.022***		
	(0.035)	(0.039)	(0.003)	1,492	.3255
Telec	-0.045	0.399***	0.022***		
	(0.047)	(0.039)	(0.004)	1,492	.3285

Notes: The dependent variable is TFP. Robust standard errors in brackets.*** p<0.001, **p<0.05, * p<0.01. Industry and year dummies included, TFP it is obtained using Levinsohn and Petrin (2003) procedure; lworkt_2$_{i,t-2}$ denotes the average number of workers lagged in two periods and foreign owner $_{i,t}$ is a dummy variable that take value 1 if the firm is owned by foreigners and 0 otherwise. Time and industry dummies are not reported to save space. See Table A.1 for the definition of the IC variables.

Egyptian firms make on average 29 tax payments by year, spend 392 hours by year filing the required document and preparing and paying taxes and total taxes paid amount to 42.6% of their profit (Table A.2). Indeed, the country ranks at position 148 of 189 economies on the ease of paying taxes. Our results also highlight that tax rates affect negatively firm productivity of Egyptian manufacturing companies; in this line, the Egyptian government should review their fiscal policy to promote firm competitiveness of manufacturing firms.

5. Egypt business obstacles before and after the Arab Spring

In this section we use labour productivity calculated as total sales divided by the number of full time employees as an alternative measure of firm performance. We re-estimate model (3) using this alternative variable calculated dividing total sales ($lsales_{i,t}$) by the average number of workers ($lworkt_{i,t}$). The explanatory and control variables are the same as in specification (3).

The main results obtained by using labour productivity of Egyptian companies as dependent variables for the years 2006 and 2013 are presented in Table 4. As previously, we include each obstacle individually in the model to avoid problems of multicolineality and we only present those obstacles that are statistically significant.

Table 4 shows in columns (1) and (2) the results for 2006 and 2013, respectively. Several conclusions could be drawn from the comparison between columns (1) and (2). On the one hand, exporter status, foreign ownership, electricity, labour regulation, skills and education remained significant in both periods. On the other hand, access to land, customs and trade regulations as well as legal systems become insignificant in 2013, while access to finance, macroeconomic uncertainty, corruption, and illegal competition became significant in 2013.

Table 4. Impact of Business Obstacles on labour productivity in 2006 and 2013

Dep. Var.labour productivity		
Year	2006	2013
Expl. Var:		
Exporter status	0.616***	0.704***
	(0.124)	(0.0865)
Foreign ownership	0.0132***	0.00342*
	(0.00346)	(0.00176)
Ln age	-0.264***	-0.196***
	(0.0633)	(0.0389)
Electricity	-0.0626*	-0.0749***
	(0.0352)	(0.0240)
Access to land	0.123***	-0.0297
	(0.0388)	(0.0333)
Regulatory and policy uncertainty (political Instability)		-0.0772**
		(0.0349)
Tax rates		-0.0962***
		(0.0252)
Tax adminitration		-0.115***
		(0.0269)
Customs and trade regulations	-0.0910**	0.00469
	(0.0459)	(0.0419)
Labour regulations	-0.0679**	-0.0731**
	(0.0316)	(0.0304)
Skills and education	-0.0679**	-0.0902***
	(0.0316)	(0.0301)
Business licencing and permits		
Access to finance	-0.0320	-0.156***
	(0.0433)	(0.0264)
Macroeconomic uncertainty	-0.0273	-0.0772**
	(0.0357)	(0.0349)
Corruption		-0.0722***

		(0.0234)
Thef, disorder and crime		-0.0294
		(0.0262)
Illegal competition from informal sector	0.00890	-0.105***
	(0.0326)	(0.0294)
Legal system	0.102**	-0.0372
	(0.0413)	(0.0420)
Industry dummies	Yes	yes
Observations	962	1667
R-squared	0.111	0.141

Notes: The dependent variable is total sales divided by number of workers in year t. Robust standard errors in brackets.*** p<0.001, **p<0.05, * p<0.01. Industry dummies included, foreign owner $_{i,t}$ is a dummy variable that take value 1 if the firm is owned by foreigners and 0 otherwise. Industry dummies are not reported to save space. § year denotes the year in which the questionnaire was launched.

Our results are in line with those presented in the Doing Business Report (2013) focus in Egyptian economy, in the mentioned report. Firstly, it is worth mentioning that Egypt is ranked at position 128 of a total 189 economies in the Doing Business Rank for 2014[5], (DB-WR) meaning that obstacles in Egypt to do business are important. If we compare Egypt with some other MENA countries (see Table A.3 on Appendix). In general Egypt is in at the bottom of the ranking, only surpassed by Algeria. It is however better positioned on getting credit, compared with the MENA countries selected. Despite this fact, our results suggest that financial access and financial cost are affecting negatively firm productivity in Egypt, more effort should be made to overcome finance constrains in the country. Table 3 indicates that water and electricity constrains are negatively affecting TFP. Access to reliable and affordable electricity is vital for businesses and in Egypt, getting electricity requires 7 procedures, takes 54 days and costs 337.4% of income per capita, the country is ranked at position 105 of 189 economies on the ease of getting electricity, hence an effort to ensure safety in the connection process is needed, while keeping connection costs reasonable. This must be a major objective for the future government (see Table A.2 in the Appendix). Other important business obstacles that matter for TFP are tax rates, we know that tax rates are needed for a proper functioning of the economy, therefore the government must chose their tax rates carefully in order to foster consumption and consequently support investment decisions of firms and individuals.

[5] The Doing Business World Bank Rank is only available for 2013 and 2014 for the Egyptian economy. Due that we cannot have information for our analysed period, we need use this information carefully.

6. Comparison with other MENA countries before and after the Arab spring

In this section we summarise the results obtained for other countries in the region, namely Jordan, Lebanon, Morocco and Tunisia using datasets before and after the Arab spring. For Tunisia, however there is only one survey in 2013 and therefore we cannot make the comparison with the previous years. Also for Yemen (results are not presented, available upon request), there were two questionnaires available for 2010 and 2013. The results indicate that only access to electricity and access to finance are negatively correlated with labour productivity when using the dataset corresponding to the 2010 questionnaire and only access to finance remains significant when pooling the data for both waves.

For Lebanon, Jordan and Morocco, we have estimated models for a single cross-section adding to the regressions industry dummies. We focus on labour productivity as dependent variable, defined as sales divided by number of permanent workers. We are aware of the fact that with this simple modelling strategy we are not able to establish causality, as for the Egyptian case study in the previous section, hence the coefficients indicate correlations. Despite the simplicity, we believe that the results are illustrative and give us some insights that could help to compare the estimates before and after the revolutions that affected this region.

The main results are presented in Table 5. Only the estimated coefficients of the business constraints that are statistically significant are reported. The first part of the table presents the results for Lebanon, Jordan and Morocco corresponding to the questionnaires of the years 2006 and 2007, that is, before the Arab Spring. The second part of the table present results for the same countries using the questionnaires implemented in 2013 and the third part report results for Tunisia and Egypt also using 2013 questionnaires, but for Tunisia this is the only questionnaire available and therefore the comparison with previous years is not possible. For the Egyptian case we are able to draw some conclusion in comparison with the more detailed results shown in the previous sections.

As a first sight it is remarkable that the number of constrains that appear to be statistically significant considerable increase after the Arab revolution in comparison with before for a given country. Moreover, regulatory policy uncertainty is negatively correlated with firm performance in Jordan, Morocco and Tunisia after 2011 (also in

Egypt, see Table 4), whereas access to finance and lack of adequate skills seems to be important obstacles for Jordan, Tunisia and Egypt in 2013 (results in Table 4 for Egypt indicate that the coefficient increase in magnitude in 2013 in comparison with 2006). Most of these constrains were in general not statistically significant when using the dataset for the previous waves of the surveys, which correspond to the years before the Arab Spring. Also corruption and competition from the informal sector in Jordan and Egypt (see Table 4 for Egypt) and crime in Jordan and Tunisia are negatively correlated with labour productivity after the revolution, but not before. For Lebanon however, the results are that clear-cut, with only macroeconomic uncertainty being negatively correlated to labour productivity before 2011, whereas access to land and legal constraints were positively correlated. After 2011 instead labour regulation constraints become negatively and significantly correlated to productivity.

Table 5. Impact of Business Obstacles across countries

Dep. Var. Ln labour productivity	*Period: before and after2008*						After 2011
Countries	**Lebanon**		**Jordan**		**Morocco**		**Tunisia**
Expl. Var:	Year[§]: 2006	2013	2006	2013	2007	2013	2013
Exporter status	0.293	0.238*	0.576***	0.398***	-0.644	-0.0780	0.158
	(0.229)	(0.136)	(0.179)	(0.145)	(0.396)	(0.237)	(0.107)
Foreign ownership	0.0178***	0.0110	0.00560*	0.00174	0.000703	0.00409	-0.000479
	(0.00553)	(0.00762)	(0.00285)	(0.00298)	(0.00249)	(0.00279)	(0.00178)
Ln age	0.0467	-0.0710	0.0544	0.0515	0.357*	0.142**	0.0250
	(0.114)	(0.0663)	(0.0562)	(0.0487)	(0.187)	(0.0659)	(0.0550)
Electricity							
Access to land	0.105**	0.105**					
	(0.0477)	(0.0477)					
Regulatory and policy uncertainty (political Instability)			-0.0791*	-0.161***		-0.129*	-0.0952**
			(0.0461)	(0.0457)		(0.0661)	(0.0405)
Tax rates					0.205***		
					(0.0723)		
Tax adminitration					0.347***		
					(0.122)		
Customs and trade regulations		0.143**					
		(0.0633)					
Labour		-0.112*					-0.0929*

regulations							
		(0.0662)					(0.0534)
Skills and education				-0.100*			-0.101**
				(0.0519)			(0.0422)
Business licencing and permits		0.167*					
		(0.0950)					
Access to finance				-0.116**			-0.148***
				(0.0487)			(0.0384)
Macroeconomic uncertainty	-0.150*						
	(0.0865)						
Corruption				-0.109**			
				(0.0512)			
Thef, disorder and crime				-0.228***			-0.0632*
				(0.0662)			(0.0362)
Illegal competition from informal sector				-0.115*			
				(0.0643)			
Legal system	0.165*			-0.114*			
	(0.0841)			(0.0643)			
Industry dummies	yes	Yes	yes	yes	yes	yes	yes
Observations	196	335	465	349	126	307	480
R-squared	0.216	0.199	0.142	0.142	0.412	0.149	0.394

Notes: The dependent variable is total sales divided by number of workers in year t. Robust standard errors in brackets.*** p<0.001, **p<0.05, * p<0.01. Industry dummies included, foreign owner $_{i,t}$ is a dummy variable that take value 1 if the firm is owned by foreigners and 0 otherwise. Industry dummies are not reported to save space. § year denotes the year in which the questionnaire was launched.

As robustness check we have estimated two pooled regressions with all countries, and using country fixed effects. The first regression uses data for the period before 2008, and the second for the period after 2008. This enables us to do a broad comparison between the before and after the Arab Spring. The results are shown in Table 6. The main results show that access to electricity and tax rates were the only two constraints for which we find a negative correlation with labour productivity for the years before the Arab Spring (column 1). However, the results in column (2) of Table 6 show that access to electricity is still a constraint, but with a coefficient lower in magnitude. There are another four business environment indicators that also show a negative and significant coefficient in the regressions for the years after the revolution, namely, regulatory and policy uncertainty, access to finance,

macroeconomic uncertainty and corruption as well as illegal competition from the informal sector (this last one only at the 10 significance percent level).

Table 6. Impact of Business Obstacles for all MENA countries

Expl. Var: ln Labour productivity	(1)	(2)
year	Before 2008	After 2008
Exporter status	0.613***	0.325***
	(0.104)	(0.0455)
Foreign ownership		0.00251***
		(0.000929)
Ln age	-0.00155	0.0170
	(0.0536)	(0.0235)
Electricity	-0.0778**	-0.0460***
	(0.0326)	(0.0154)
Access to land	0.0233	0.0235
	(0.0348)	(0.0163)
Regulatory and policy uncertainty (political Instability)	0.0466	-0.0713***
	(0.0355)	(0.0180)
Tax rates	-0.0758**	-0.0124
	(0.0345)	(0.0155)
Tax adminitration	-0.0188	-0.0187
	(0.0325)	(0.0160)
Customs and trade regulations	0.0671*	0.0375***
	(0.0354)	(0.00738)
Labour regulations	-0.00687	-0.00503
	(0.0336)	(0.0177)
Skills and education	0.0210	-0.00303
	(0.0329)	(0.0172)
Business licencing and permits	0.0222	0.00640
	(0.0342)	(0.0178)
Access to finance	-0.0356	-0.0968***
	(0.0326)	(0.0148)
Macroeconomic uncertainty	0.0740*	-0.0713***
	(0.0418)	(0.0180)
Corruption	0.0184	-0.0516***
	(0.0316)	(0.0139)
Thef, disorder and crime	-0.0615	-0.0228
	(0.131)	(0.0155)
Illegal competition from informal sector	-0.0376	-0.0296*
	(0.0601)	(0.0155)
Legal system	0.0151	0.365***
	(0.0362)	(0.0462)
Industry dummies	Yes	Yes
Country dummies	yes	yes
Observations	1,538	5,034
R-squared	0.864	0.749

Notes: The dependent variable is total sales divided by number of workers in year t. Robust standard errors in brackets.*** p<0.001, **p<0.05, * p<0.01. Industry dummies included, foreign owner $_{i,t}$ is a dummy variable that take value 1 if the firm is owned by foreigners and 0 otherwise. Industry dummies are not reported to save space. § year denotes the year in which the questionnaire was launched.

7. Conclusions

In this paper we investigate the extent to which twenty-two different business environmental constraints affect firm performance of firms in MENA countries. The main focus has been on Egyptian firms, given that Egypt is the only large economy in the region and that better quality data are available for this country. In the core of the paper, we use a panel data set for Egyptian manufactured firms over a period of five years covering from 2003 to 2007 obtained from the World Bank Enterprise Survey. We use the data in two ways. Firstly, we test whether a number of firm characteristics, namely firm size, participation in international trade and foreign ownership have an impact on the perception of each business environmental obstacle. Secondly, we test the relevance of a number of businesses constrains and its effect on firms performance for Egyptian firms. Next, we focus on medium-size economies and evaluate also the effect of the main obstacles for doing business for firms located in these countries, before and after the Arab Spring. Two waves of data are available for Lebanon, Jordan and Morocco and one for Tunisia. For these three countries we are able to compare the results obtained before and after the uprising. Finally we also compare the results obtained before and after the Arab Spring for all countries pooled together and adding country fixed effects.

Our results are in line with existing research indicating that larger firms; international firms and foreign firms are less affected by the business environmental obstacles than small, domestic and non-foreign firms. The analysis also indicates that financial access and financial cost followed by tax rates and water constrains are the most important factors affecting firm performance in Egyptian manufactured firms. Our results point towards the importance of designing new policies that develop basic infrastructures and provide better access to water and electricity in Egypt. Also, we highlight that Egyptian policy makers should revise their fiscal policies and improve access to and cost of finance to facilitate economic and employment growth through improving business competitiveness. We leave for further research the identification the different types of firms that are more affected by the abovementioned constraints.

As regards other Mena countries, the number of constrains that appear to be statistically significant considerable increase after the Arab revolution in comparison with before for most countries considered individually. More specifically, regulatory policy uncertainty is negatively correlated with firm performance in Jordan, Morocco and Tunisia after 2011, whereas access to finance and lack of adequate skills seems to be important obstacles for Jordan, Tunisia and Egypt in 2013. These constrains were in general not statistically significant when using the dataset for the previous waves of the surveys, which correspond to the years before the Arab Spring. Also corruption and competition from the informal sector in Jordan and Egypt and crime in Jordan and Tunisia are negatively correlated with labour productivity after the revolution, but not before. For Lebanon however, the results are that clear-cut. The main limitation of these results is that we are only able to establish correlations, but not the direction of causality, mainly due to the lack of panel data availability. These results are confirmed when pooling the data for all countries before and after 2008.

A more in deep analysis could be a next steep to better understand how taxes rates, access to and cost of finance, water and electricity constrains and political uncertainty affect firm productivity depending on the characteristics of the firm, its location and managerial structure. This detailed analysis is necessary if governments want to design effective policies.

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Appendix

Table A.1 Variables description

		Description	Question	Question num
International	**$exp_{i,t}$**	Dummy variable that take value 1 if firm export more than 10 per cent in year t	What percent of your establishment's sales were exported directly in current year	Authors elaboration from variable q19b1
Size of the firm	**$sales_{i,t}$**	Total sales in t. Value in thousands of Egyptian pounds (deflated by the production price index (PPI) for manufactures).	Total sales/PPI	q122a2 and authors elaboration
	labour $_{i,t}$	Average number of workers in t	Refers only to permanent workers of your establishment. Permanent workers are defined as all (paid) long term (i.e. for one year or more) employees with guarantee of renewal of employment contract.	q107c
Total Factor productivity (TPF)	**capital $_{i,t}$**	Total fixed tangible assets (deflated by the production price index (PPI) for manufactures).	Value of your total assets?	q128a1 and q128a2 and authors elaboration
	materials $_{i,t}$	Total purchases of raw material and intermediate goods (deflated by the production price index (PPI) for manufactures).	Total purchases of raw material and intermediate goods (whether used in production or not), including finished goods for resale/PPI	q122b2 and q122b1 and authors elaboration
	wages $_{i,t}$	Total cost of labor, including wages, salaries and bonuses (deflated by the production price index (PPI) for manufactures).	Total cost of labor, including wages, salaries and bonuses	q122c2 and q122c1 and authors elaboration
	PPI $_{i,t}$	Industry level production price index for manufactures with 2005 as base year.	PPI	International Financial Statistics (IFS and UN) for manufacturing
	investments $_{i,t}$	Net book value of machinery and equipment (depreciation rate not available)	What was the net book value of machinery and equipment?	q126a3 and q126a2
Ownership	**foreign $owner_{i,t}$**	Percentage of the firm owned by a foreign Arabic owner and by other foreign owner		q11a2+ q11a3

Egypt questionnaire 2002-2007	Variable	Description	Question	Question num
Investment Climate Constraints (Business environment)	Telec	Telecommunications	Please tell us if any of the following issues are a problem for the operation and growth of your business. If an issue poses a problem, please judge its severity as an obstacle on a four-point scale where: 1 denotes major 2 denotes moderate 3 denotes minor 4 denotes no obstacle	q3
	Electr	Electricity		q31b
	Transport	Transportation		q31c
	Water	Water		q31d
	Landacc	Access to Land		q31e
	Landpr	Price of land		q31f
	Policy	Regulatory Policy Uncertainty		q31g
	Taxrate	Tax Rates		q31h
	Taxadm	Tax Administration		q31i
	Customs	Customs and Trade Regulations		q31j
	Laborreg	Labor Regulations (Like Social Insurance)		q31k
	Skills	Skills and Education of Available Workers		q31l
	Licence	Business Licensing and Operating Permits		q31m
	Finanacc	Access to Financing (Ex: Collateral)		q32a
	Financost	Cost of Financing (Ex: interest rates)		q32b
	Macro	Macroeconomic Uncertainty (Ex: inflation, exch. rate)		q32c
	Corrupt	Corruption		q32d
	Ilegalcominf	Illegal Competition from the informal sector/smuggling and dumping		q32e
	Ilegalcomfor	illegal Competition from the formal sector		q32f
	Laws	Legal System/ Conflict Resolution		q32g
	Crime	theft,disorder and crimes		q32h
	Other	Other (Specify like government subsidies...)		q32oth
	Firstobs	the biggest obstacle for your establishment		q33a

	Secondobs	The second biggest obstacle for your establishment	Among all of the above alternatives in parts a and b, please indicate which one constitutes	q33b
	Thirdobst	The third biggest obstacle for your establishment		q33c

2013 questionnaires	**Variable**	**Description**	**Question**	**question num**
Investment Climate Constraints (Business environment)	Telec	Telecommunications	Please tell us if any of the following issues are a problem for the operation and growth of your business. If an issue poses a problem, please judge its severity as an obstacle on a four-point scale where: 1 denotes major 2 denotes moderate 3 denotes minor 4 denotes no obstacle	c30b
	Electr	Electricity		c30a
	Transport	Transportation		d30
	Water	Water		
	Landacc	Access to Land		g30a
	Landpr	Price of land		
	Policy	Political instability		j30e
	Taxrate	Tax Rates		j30a
	Taxadm	Tax Administration		j30b
	Customs	Customs and Trade Regulations		d30b
	Laborreg	Labor Regulations		l30a
	Skills	Inadequately educated work force		l30b
	Licence	Business Licensing and Operating Permits		j30c
	Finanacc	Access to Financing (Ex: Collateral)		k30
	Corrupt	Corruption		**j30f**
	Ilegalcominf	Illegal Competition from the informal sector/smuggling and dumping		**e30**
	Courts	courts		**h30**
	Laws	Goverment officials interpretations of laws and regulations affecting the firm are consistent and predictable		**j1a**
	Crime	theft,disorder and crimes		**i30**

	Court system	The cour system is fair partial and uncorrupted		**h7a**
	Firstobs	the biggest obstacle for your establishment	Among all of the above alternatives in parts a and b, please indicate which one constitutes	m1a
	Secondobs	The second biggest obstacle for your establishment		**m1b**
	Thirdobst	The third biggest obstacle for your establishment		**m1c**

A.1.2. Data cleaning and outliers

The Egyptian dataset includes 3,129 firms for the years 2004, 2005 and 2007. For some variables, namely sales, exporting and importing status we are able to use information for an additional year per questionnaire, since each firm is asked in the questionnaire for the value of sales and the export/import status not only in the current but also in the previous year. Some firms are only included in one or two waves, whereas 554 firms are included in the three questionnaires. Hence, using the available information for these firms we build a panel dataset from 2003 to 2007 obtaining 2,770 observations, after dropping 34 firms, which declared that the average number of workers was less than five. We disregarded these firms for consistence, because according to the Enterprise World Bank methodology, only firms with 5 or more employees are targeted.

The data set includes also information about the investment climate constraints to Egyptian firms. To measure the investment climate constraints of the firms, we use data measuring the obstacles that firms identify as the main constrains for its operations and growth of their business. Respondents rank twenty-two obstacles within a scale from 0 to 4, where 0 means "No obstacle" and 4 is the maximum value meaning "very severe obstacle". While cleaning the data we eliminated all the data points for with the information was coded as (-5, -9) and outliers concerning the added variable have been eliminated.

Table A.2 Doing Business Rank of Egypt (Getting Electricity, Getting Credit and Paying Taxes)

Economy	Year	Ease of Doing Business Rank	Getting Electricity				Getting Credit					Paying Taxes						
			Rank	Procedures (number)	Time (days)	Cost (% of income per capita)	Rank	Strength of legal rights index (0-10)	Depth of credit information index (0-6)	Public registry coverage (% of adults)	Private bureau coverage (% of adults)	Rank	Payments (number per year)	Time (hours per year)	Profit tax (%)	Labor tax and contributions (%)	Other taxes (%)	Total tax rate (% profit)
Egypt	2004	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Egypt	2005	..	..	..	..	..	..	3	2	1.0	0.0	..	..	..	..	..	..	..
Egypt	2006	..	..	..	..	..	..	3	2	1.2	0.0	..	42	504	..	..	..	54.3
Egypt	2007	..	..	..	..	..	..	3	2	1.5	0.0	..	41	596	..	..	..	46.4
Egypt	2008	..	..	..	..	..	..	3	4	1.7	0.0	..	36	711	..	..	..	45.1
Egypt	2009	..	..	..	..	..	..	3	5	2.2	4.7	..	29	711	..	..	..	44.0
Egypt	2010	..	..	7	54	575.9	..	3	6	2.5	8.2	..	29	480	..	..	..	43.0
Egypt	2011	..	..	7	54	509.9	..	3	6	2.9	10.3	..	29	433	..	..	..	42.6
Egypt	2012	..	..	7	54	455.5	..	3	6	3.5	13.7	..	29	433	..	..	..	43.6
Egypt	2013	127	104	7	54	396.0	82	3	6	4.3	16.4	149	29	392	13.2	25.8	3.6	42.6
Egypt	2014	128	105	7	54	337.4	86	3	6	5.3	19.6	148	29	392	13.2	25.8	3.6	42.6

Source: Doing Business World Bank (2014)

Table A.3 Doing Business Rank for different MENA countries

	Ease of Doing Business Rank					Getting Electricity					Getting Credit					Paying Taxes				
	DZA	EGY	JOR	LBN	MAR	DZA	EGY	JOR	LBN	MAR	DZA	EGY	JOR	LBN	MAR	DZA	EGY	JOR	LBN	MAR
2013	151	127	119	105	95	139	104	39	48	95	126	82	167	105	105	173	149	35	36	115
2014	153	128	119	111	87	148	105	41	51	97	130	86	170	109	109	174	148	35	39	78

DZA mean Algeria, EGY means Egypt, JOR means Jordan, LBN means Lebanon, MAR mean Morocco