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"The determinants of export performance of firms in selected MENA countries: Comparison to CEE countries, Israel and Turkey"

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The determinants of export performance of firms in selected MENA countries. Comparison to CEE countries, Israel and Turkey

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Abstract

In this paper we study the determinants of export performance of firms in selected MENA countries jointly and separately and compare them to the performance of firms from Central and Eastern European (CEE) countries. The analysis is based on information on individual firms contained in the BEEPS V data base, and covers the period of 2011-2014. We estimate the probability of exports controlling for country and sector specific effects using the probit model. We find that in both groups of countries similar variables affect firm export performance. Our empirical results obtained for the MENA and CEE countries indicate that the probability of exporting is positively related to the level of productivity, firm size, spending on research and development, the share of university graduates in productive employment and the internationalization of firms. State ownership and the perception of corruption by firms are mostly not statistically significant. The results obtained for the two groups of countries are statistically not very different, but enough to have some policy implications while results for particular countries and sub-groups of countries reveal a large degree of heterogeneity.

Key words: export performance, MENA, CEE, probit.

Introduction

The level of globalization of the world economy has been steadily increasing. Is it really a common phenomenon, in which all economic sectors and all companies in a country participate? Is the opening up of economies, seen from the microeconomic perspective, characterized by similar mechanisms in different countries? Do firms from MENA countries, where trade liberalization has taken place relatively recently, behave as expected according to existing trade theories? Do they behave like firms in the OECD countries (including Turkey and Israel)? To this end in this paper we would like to go for the verification of several theoretical hypotheses, based on empirical testing using microeconomic techniques of analysis of firm-level data.

The main objective of this paper is to verify whether the transition of firms in the selected MENA countries to the requirements of globalized market economies is already completed or not yet. In particular, we analyze and compare the export behavior of firms from the selected MENA countries with that of firms from countries of Central and Eastern Europe (CEE), Israel and Turkey. We want to treat the firms from CEE, Israel and Turkey as the benchmark, since there are many similarities, in terms of transition, between the countries selected (MENA, Turkey, Israel and CEE countries). Moreover, recent reports (e.g. IMF 2014) demonstrate that the transition process in the CEE countries has already been completed successfully. The export performance of CEE firms in various regions has already been analyzed compared to the behavior of firms in the EU-15 countries by academics that are

part of this project (e.g. Cieslik, Michalek, Michalek, 2014, and Cieslik, Michalek, Michalek and Mycielski, 2015).

In particular, the main goal of the present study is the empirical verification of the main hypotheses resulting from the Melitz (2003) model, which is a positive relationship between the productivity of companies and their involvement in export activities using firm-level data for the selected MENA countries. Then, in the study we will endogenize the productivity of companies, among others, by referring to their spending on research and development (R&D), human capital and new technologies, and their size. We will also control for the ownership characteristics and the significance of corruption. This analysis will allow the identification of key factors influencing the export competitiveness of individual firms, and shed some light on the entire economies of the MENA countries. Finally, we will try to determine to what extent the determinants of export behavior of companies in this region are similar to the specific firms operating in the group of more developed CEE countries, as well as Turkey and Israel.

This will allow empirical verification of key relationships described in the theoretical model of Melitz (2003) for companies in the MENA countries. The aggregated analysis will cover the following eight MENA countries: Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia, as well as Turkey and West Bank and Gaza. We will study the behavior of firms in selected larger MENA countries, for which the number of observations was sufficient for the econometric analysis. Special attention will be devoted to Egypt, for which we have the largest number of observations. We will also analyze separately the behavior of firms in Israel and Turkey, which are the most developed countries among the analyzed countries.

In the paper we will undertake the following research questions, resulting directly from the theory: i) Does the selection mechanism operate as described by the Melitz (2003) model, i.e., is it true that only the most productive companies are able to export their products

and less productive firms sell them in the domestic market only?, ii) To what extent productivity is determined by the innovation activities (including expenditure on R&D), and to what extent by other factors?, iii) Do economies of scale, measured by the number of employees, have a significant, positive impact on exports of the analyzed companies?, iv) What is the impact of the quality of human capital (skilled workers, university graduates), available to companies, on their export competitiveness?, v) Does internationalization of firms facilitate export performance (relationships with licensors, parent companies, foreign investment)?, vi) Is the set of factors relevant to the export development for firms of MENA countries different from the factors affecting the competitiveness of companies from Turkey, Israel, CEE and other EU countries?, vii) Do firms in the MENA region have different propensity to export?, viii) What should be the role of government in raising the export competitiveness and internationalization of domestic enterprises?

The empirical study will enable us to obtain comparable results on the potential role of various firm characteristics in the selected MENA countries and for particular countries and to formulate conclusions concerning policy recommendations aimed at increasing the export competitiveness of economies and the creation of an appropriate institutional environment. The originality of our recommendations comes from the fact that no direct export promotion is needed, if the appropriate structural policies are adopted. The recommendations resulting from the analysis can be treated as an indirect way of promoting exports.

This paper is organized as follows. In Section 1 we survey the relevant literature on the determinants of export performance. In Section 2 we describe the research methodology and the dataset. In Section 3 we report our empirical results. Finally, the last section summarizes and concludes with policy guidelines and directions for future research.

1. Literature review

The empirical firm heterogeneity literature was initiated by the work of Bernard and Jensen (1995) for the United States and Clerides et al. (1998) for Colombia, Mexico and Morocco. Other studies concerned Germany (Wagner, 2002), Spain (Delgado et al., 2002; Farinas and Martin-Marco, 2007), Italy (Castellani, 2002), the UK (Girma et al., 2003, 2004, Greenaway and Kneller, 2008), Canada (Baldwin and Gu, 2003), Sweden (Hansson and Lundin, 2004; Greenaway et al., 2005, Greenaway and Kneller, 2007) and Chile (Alvarez and Lopez, 2005).

The majority of empirical studies find support for the theoretical prediction of the Melitz model, i.e. that more productive firms do self-select themselves into foreign markets. The survey of early empirical evidence on the relationship between firm productivity and exporting was provided by Tybout (2003). The extensive summaries of more recent empirical evidence on this relationship in particular countries were offered by Wagner (2007, 2012). According to the first survey by Wagner (2007), a large number of studies using data from different countries report results showing that exporters and importers are more productive that non-exporters and non-importers. In particular, his review provides clear-cut evidence in favor of the self-selection hypothesis. He argues that future exporters tend to be more productive than future non-exporters in the years before they enter the export market and often have higher *ex ante* productivity growth rates. On the other hand, Wagner (2007) shows that the evidence pertaining to the learning-by-exporting hypothesis, i.e. the possibility of reverse causality, is somewhat mixed. In particular, the empirical results for post-entry differences in performance between exporters and non-exporters point to faster productivity growth for the former group in only some studies.

This picture was largely confirmed in a more recent survey by Wagner (2012), i.e. his review provides extensive evidence in favor of the self-selection hypothesis. It has also been pointed out that the empirical results ensuing from the learning-by-exporting hypothesis might

not be robust with respect to the specific methodologies and datasets. In particular, the learning-by-exporting hypothesis was confirmed for some countries in the early studies, such as Isgut (2001) for Colombia, Blalock and Gertler (2004) for Indonesia, and Alvarez and Lopez (2005) for Chile. However, more recent firm-level evidence does not support this hypothesis. In particular, a lack of evidence for the learning-by-exporting hypothesis has been reported by Arnold and Hussinger (2005) for Germany, Damijan and Kostevc (2006) for Slovenia, Pisu (2008) for Belgium, and Smets and Warzynski (2010) for Denmark.

More recent studies focus on the role of product mix in exporting. Examples include Bernard et al. (2010), Eckel and Neary (2010) and Mayer et al. (2014). Bernard et al. (2010), argue that product switching for the US firms is correlated with both firm- and firm-product attributes, and that product adding and dropping induce large changes in firm scope. Eckel and Neary (2010) study how globalization affects the scale and scope of multi-product firms. Their model identifies a new source of gains from trade: productivity increases as firms concentrate on their core competence. Finally, Mayer et al. (2014) show theoretically and empirically for French firms that tougher competition in an export market induces a firm to skew its export sales toward its best performing products.

Another aspect of recent trends in modern trade theory is devoted to the role of trade intermediaries and indirect exports. As a result some understanding has been gained regarding how intermediaries facilitate trade (e.g. Feenstra and Hanson, 2004; Antras and Costinot, 2011) and how they differ from direct exporters (e.g. Rauch and Watson, 2004; Ahn et al., 2011). There are few studies that distinguish between direct and indirect ways of exporting (Felbermayer and Jung, 2011; Bernard et al., 2011, Lu et al., 2017). These papers show that exporters include both firms that organize the production and distribution of their goods abroad (direct exporters) as well as intermediaries that specialize in distribution in foreign markets and allow other firms export their products to foreign markets indirectly.

Empirical evidence on the relationship between productivity and exporting based on multi-country firm-level datasets is still rather scarce. In the literature, the number of empirical studies devoted to the verification of hypotheses derived from the Melitz model for the broader group of MENA and CEE countries is limited. According to Wagner (2012, p. 261): "Any attempt to extract information on the size of the effects—the economic relevance, not the statistical significance—is hindered by the absence of a reasonably high degree of comparability across the studies. This lack of comparability is due to differences in the unit of analysis (establishment vs. enterprise), the sampling frame (all firms vs. firms with a number of employees above a certain threshold only), the specification of the empirical models estimated and the econometric methods applied."

One of the first multi-country studies was the EFIGE (European Firms in the Global Economy) report (2010), which was the outcome of an inter-national research project based on comparable firm-level data from several EU countries. The results of this project confirmed the importance of firms' productivity for exporting. In this report it was demonstrated that firms' export performance in seven EU countries was dependent on labor productivity as well as other firm characteristics. The study showed that in all countries exporting firms were on average more productive and bigger compared to non-exporters. Moreover, the study showed that the probability of exporting increased with firm age, the share of university graduates in total employment, R&D spending and foreign ownership.

The analysis of differences in firm productivity in the selected MENA countries has been studied in the recent FEMISE report (2015). There is also a recent study of export performance of firms in the MENA region (Fakih and Ghazalian, 2014). The authors analyzed the significance of some firm characteristics, such as the size, age, the share of skilled workers and type of ownership on their export performance.

In our study we focus on testing the hypothesis of the impact of productivity differences on the probability of exporting in the MENA countries. In addition, we will try to take into account other firm characteristics that may affect export performance such as R&D spending, foreign technology licenses and firm foreign ownership.

In contrast to the majority of previous studies conducted for selected countries, that were carried out using national data coming from national statistical offices, our study will be based on a comparable database collected as part of a joint project between the European Bank for Reconstruction and Development (EBRD) and World Bank BEEPS (2013), which includes selected MENA countries (Algeria, Egypt, Jordan, Lebanon, Morocco and Tunisia), all countries of CEE, as well as Israel and Turkey. The BEEPS data is of available information on various characteristics of firms. This allows us to analyze the role of the variables described by the Melitz (2003) model as well as other characteristics of firms describing their innovation, the use of various forms of human capital and the use of new technologies that may affect their productivity and thus also the export activity.

The results of our empirical study should allow us to formulate policy recommendations, aimed at increasing the export competitiveness of firms and whole economies, and the creation of an appropriate institutional environment promoting international trade. In particular it should point out which are the most important firm level characteristics affecting exports in the analyzed countries and which policies can help to stimulate the exports.

2. Research Methodology and Dataset

In this paper we investigate empirically the determinants of export activity of firms in selected MENA countries. The analysis is conducted in the light of the new strand in the new theory of international trade, originating mainly from the theoretical Melitz (2003) model. The empirical study is based on micro-econometric modeling. First, to estimate the relationship

between the characteristics of firms and the probability of exports we use a probit regression. In the case of probit regressions our dependent variable describing the export activities of the company in a given year, is a binary variable taking the value of one in the case of positive exports for the company in a given year, and zero in the absence of exports for the company in a given year.

In our model, the probability of exports in the *i-th* firm in a given year is a function of its characteristics, industry characteristics and the characteristics of the country in this year. The key explanatory variable is the productivity of the company. Our main definition of productivity is labor productivity which is directly in line with the Melitz (2003) model. In addition to productivity we study also the impact of other variables on exports such as the firm size, resources, physical and human capital, the level of internationalization of companies and other variables resulting from the Melitz (2003) model, as well as from the previous empirical research based on the extension of this model.

The key explanatory variables stressed by the Melitz (2003) model – labour productivity is expressed as the total amount of annual sales per full time employee (l*prod*). Other factors that may affect export activity include the level of innovation proxied by the R&D spending (*R_D*), the stock of human capital proxied by the percentage of employees with university degrees (*univ*). In addition, we control for the foreign ownership (*fo*), the use of foreign technology (*folicenses*), the age of the firm (*age*) and the size of the firm (*size*). In addition, we control for the role of state ownership (*share_gov*) and the perception of corruption (*corruption*) at the firm level. The last two variables should reflect the legacy of a state controlled economy in the CEE and some MENA countries. The exact definitions of firm characteristics used in our study are presented in Table 1.

Table 1. Description of variables used in the empirical study

Variable	Description
Export	Dependent binary variable, that takes the value 1 if the establishment is exporting (directly or indirectly) at least one percent of its sales and 0 otherwise
Export direct[5]	binary variables, that takes the value 1 if the establishment is exporting directly and zero if not
Export indirect	binary variables, that takes the value 1 if the establishment is exporting indirectly and zero if not
lprod	logarithm of productivity expressed as total amount of annual sales per full time employee
age	the number of years since the start of operation
R_D	Binary variable, that takes value of one if the establishment was spending money of research and development over last three years, and 0 otherwise
luni	logarithm of % employees at end of fiscal year with a university degree
lsize	Logarithm of no. permanent, full-time employees of this firm at end of last fiscal year
fo	binary variable, that takes the value 1 if its shares are owned by private foreign individuals, companies or organizations and 0 otherwise
folicenses	binary variable, that takes the value 1 if the establishment uses technology licensed from a foreign-owned company and 0 otherwise
Multi[6]	100 minus the share of main product in total sales. This variable measures whether the firm is producing many (multiple) products (zero means that the main product represents 100% of supply)
share_gov	the percentage of firm owned by the state/government
corruption	Corruption: its perception as an obstacle to current operation of the establishment (0 stands for non-obstacle and 4 for a very serious obstacle)

Source: BEEPS dataset.

We use the probit model to study the relationship between labour productivity and exporting, having controlled for other firm characteristics. Building on the previous theoretical literature we develop an empirical model to investigate the effects of various firm characteristics on their export performance. Our variable follows:

$$Y^{i*} = X_i\theta + \varepsilon_i \quad (1)$$

where X_i is vector of firm characteristics affecting the tendency to export, θ is the vector of parameters on these characteristics that need to be estimated, while ε_i is an error term which is assumed to be normally distributed with the zero mean and variance of one.

[5] The role of direct and indirect exports is analyzed in Bernard et. al. (2010). These two variables are used only in the robustness test in the Appendix.
[6] The role of product mix for exporters is analyzed in Mayer et. al. (2014). This variable is used only in the robustness test in the Appendix.

Instead of observing the volume of exports we observe only a binary variable indicated the sign of Y^{i*}.

$$Y^i = \begin{cases} 1 & if\ Y_i^* > 0 \\ 0 & if\ Y_i^* < 0 \end{cases} \quad (2)$$

The probability that a firm is involved in exports as a function of firm, industry and country characteristics can be written as:

$$\Pr\left(Y_i = 1 \middle| X_i\right) = \Phi\left(X_i\theta\right) \quad (3)$$

Our study is based on the "EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS) V" data collected by the World Bank and the European Bank for Reconstruction and Development in the post-communist countries located mainly in Europe and Central Asia (ECA) and the MENA countries. The main objective of the BEEPS survey was to obtain feedback from enterprises in the aforementioned countries on the state of the private sector. The survey examined the quality of the business environment. The survey questions concerned the identification of firms, sectors of activity, legal and economic status, characteristics of managers and size of the firms, the infrastructure of services in analyzed countries, economic performance and key characteristics of reviewed firms, as well as stakeholders.

The sample includes data covering the period 2011-2014. Almost 60% of surveys of firms in all countries were made in the year 2013.[7] This means that all the data should be treated as a cross section sample, and that the application of panel data analysis is not possible.[8] The variables expressed in local currencies (e.g. sales) were converted into common currency (US dollar). The BEEPS surveys covered both manufacturing and services sectors

[7] The numbers of observations (surveys) per year were as follows: 2884 in 2011, 1833 in 2012, 13435 in 2013 and 4287 in 2014. The total number of observations equals to 22,449 observations.
[8] The only exception was Albania. The details concerning the sampling methodology are explained in the Sampling Manual available at http://www.enterprisesurveys.org/Methodology/.

and are representative of the variety of firms according to sector and location within each country. The number of firms operating in the service sector was relatively small compared to the manufacturing sector. Therefore, it was not possible to perform estimations separately for the manufacturing and service sectors. Moreover, particular industries within each sector can differ with respect to their capital intensity and export performance. Therefore, to control for heterogeneity across industries in our estimations, we used industry-specific effects in addition to individual firm characteristics.

In all countries where a reliable sample frame was available, the sample was selected using stratified random sampling. Therefore, we used the standard probit procedure on the pooled cross-section dataset without controlling for individual firm effects. However, we control for country-specific and sector-specific effects. The list of countries in our sample is presented in Table A1 in the Appendix. In the majority of cases the data includes about 250-350 observations per country. The largest samples of firms are available for Russia (4220), Egypt (2897), Turkey (1334) and Ukraine (1002). The summary statistics for variables used in our empirical study are presented in Table 2.

Table 2: The summary statistics for variables used in the empirical study for the whole sample of 22,449 observations

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	22220	16.26161	13.5911	0	190
R_D	22260	.1097934	.312639	0	1
Uni	21271	32.90867	30.90337	0	100
Size	22274	76.28747	338.1886	1	21000
Fo	22449	.0853045	.2793405	0	1
folicenses	22220	.1308731	.3372691	0	1
share_gov	22181	.7662414	7.115228	0	99
corruption	21588	1.456735	1.50862	0	4

Source: BEEPS dataset.

Table 3: The correlation table for variables used in the empirical study for the whole sample of 22,449 observations

	age	R_D	Luni	Lsize	fo	folice~s	share_~v	corrup~n
Age	1.0000							
R_D	0.0661	1.0000						
Luni	-0.0624	0.0617	1.0000					
Lsize	0.2577	0.1845	0.1561	1.0000				
Fo	0.0062	0.0822	0.0467	0.1805	1.0000			
folicenses	0.0210	0.1502	0.0464	0.1642	0.1283	1.0000		
share_gov	0.0892	0.0075	0.0190	0.1136	0.0177	0.0063	1.0000	
corruption	0.0695	0.0542	0.0332	0.0189	-0.0009	-0.0064	-0.0485	1.0000

Source: BEEPS dataset.

3. Estimation results

In this section we report three sets of our estimation results. First, in Table 4 we report the results obtained for the joint sample of both CEE and MENA countries included in the BEEPS-V database, then for the whole group of eight MENA countries and compare them to the estimation results obtained for the whole group of CEE countries. Then, in Table 5 we report the estimation results obtained for various subgroups of the CEE countries; in particular with the split of the group into the two sub-groups: the members of the European Union and the non-members of the European Union. We also report the estimation for 6 MENA countries (excluding Turkey and Israel). Finally, in Table 6 we report estimation results obtained separately for the individual MENA countries.

Table 4. The results of probit estimations for the whole sample of countries, MENA and all CEE countries.

	All countries			MENA-8			All CEE		
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
lprod	-0.0120***	0.0414***	0.0705***	0.0490***	0.0440***	0.0528	-0.025***	0.0387***	0.0912***
	(0.00442)	(0.00878)	(0.0198)	(0.00745)	(0.0135)	(0.0367)	(0.00599)	(0.0121)	(0.0208)
age	0.00708***	0.00190**	0.00172	0.00196	0.00211	0.00265	0.00791***	0.00136	0.000123
	(0.000843)	(0.00091)	(0.00113)	(0.00123)	(0.00130)	(0.00182)	(0.00127)	(0.00136)	(0.00133)
R_D	0.599***	0.492***	0.439***	0.631***	0.502***	0.509***	0.620***	0.508***	0.415***
	(0.0333)	(0.0353)	(0.0569)	(0.0583)	(0.0601)	(0.147)	(0.0422)	(0.0447)	(0.0487)
luni	-0.0275***	0.0211***	0.0312***	-0.00610	0.0239***	0.0319***	-0.0441***	0.0173**	0.0300***

	(0.00450)	(0.00523)	(0.00619)	(0.00732)	(0.00816)	(0.00958)	(0.00602)	(0.00713)	(0.00908)
lsize	0.253***	0.286***	0.265***	0.308***	0.333***	0.306***	0.203***	0.255***	0.242***
	(0.00947)	(0.0102)	(0.0252)	(0.0152)	(0.0161)	(0.0399)	(0.0127)	(0.0135)	(0.0255)
fo	0.596***	0.495***	0.469***	0.452***	0.487***	0.476***	0.707***	0.509***	0.466***
	(0.0405)	(0.0428)	(0.0647)	(0.0705)	(0.0739)	(0.150)	(0.0508)	(0.0538)	(0.0574)
folicenses	0.330***	0.267***	0.250***	0.431***	0.245***	0.244	0.316***	0.285***	0.258***
	(0.0329)	(0.0351)	(0.0615)	(0.0599)	(0.0630)	(0.161)	(0.0410)	(0.0432)	(0.0570)
share_gov	-0.0075***	-0.0045**	-0.0039**	-0.00611	-0.00481	-0.00367	-0.00481**	-0.00358*	-0.00286
	(0.00167)	(0.00176)	(0.00177)	(0.00385)	(0.00402)	(0.00300)	(0.00189)	(0.00197)	(0.00209)
corruption	-0.00841	0.0124	0.0179*	-0.043***	0.0194	0.0162	-0.00491	0.00973	0.0208
	(0.00765)	(0.00901)	(0.0105)	(0.0124)	(0.0144)	(0.00989)	(0.0106)	(0.0118)	(0.0163)
Constant	-1.582***	-2.270***	-2.474***	-2.217***	-2.451***	-2.419***	-1.333***	-2.483***	-2.593***
	(0.0662)	(0.133)	(0.279)	(0.108)	(0.185)	(0.561)	(0.0879)	(0.203)	(0.238)
Country effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Sectoral effects	No	No	Yes	No	No	Yes	No	No	Yes
Observations	16,113	16,113	16,113	5,453	5,453	5,453	10,237	10,237	10,237
Log likelihood	-7846	-7078	-6730	-2925	-2682	-2617	-4605	-4223	-3924
Pseudo R2	0.126	0.211	0.250	0.151	0.221	0.240	0.115	0.189	0.246

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Our estimation results for the full sample of countries, including both the CEE and the MENA countries, are presented in columns (1) - (3). In column (1) we present the results obtained without controlling for individual country and sector specific effects; in column (2) we control for country specific effects while in column (3) we control for both country and sector specific effects. We treat these estimations as the benchmark results for all other comparisons in this section. Tables 4 and 5 apply the same format of presentations for other country aggregates.

The estimation in column (1) reveals that the estimated parameter on the measure of productivity displays an unexpected negative sign and is statistically significant at the 1 per cent level. However, this surprising result disappears when we control for country and sector specific effects (columns (2) and (3), respectively). The change of the sign of the estimated parameter on the measure of productivity probably reflects large differences in labour productivity among analysed countries in the full sample.

The positive sign of the estimated parameter on the productivity variable reported in columns (2) and (3) which is statistically significant at the 1 percent level means that a higher level of productivity is positively related to the probability of exporting. This result is in line with the main prediction of the Melitz (2003) model concerning the positive nexus between productivity and the probability of exporting.

Another slightly surprising result appears regarding the case of the variable *age,* for which the estimated parameter is statistically not significant in the majority of our specifications. This result is in contrast with the findings of many empirical studies (e.g. EFIGE 2010) for developed countries in which older firms are usually more efficient in producing and exporting goods and services. However, studies for CEE countries reveal that the age variable is often not statistically significant since the history of transition is relatively short, and older firms, which were under state control in the past, are frequently not very efficient and less export oriented.[9]

The majority of our control variables are statistically significant at the 1 per cent level. The estimated signs of parameters of standard explanatory variables are in line with the expectations and results of other studies discussed in the literature review section. The estimated parameters of the human capital variable (*luni*) and R&D *(R_D*) display positive signs and are statistically significant the 1 per cent level[10]. This means that the R&D activities and the share of workers with university degrees in total employment are positively related to the probability of exporting.

The firm size variable also displays an expected positive sign, at 1 percent level of statistical significance, indicating the importance of economies of scale for exporting. The variables measuring foreign ownership (*fo*) and the use of foreign technology (*folicenses*)

[9] See e.g. Cieslik et al. (2015). In some estimations the sign of the age variable displays negative signs. For additional comments regarding the role of the state control past see the comments on variable *share_gov*.
[10] The sign of the *uni* variable displays a negative sign when we do not control neither for country or for sector specific effects, but a positive one if we control for those two effects (columns (2) and (3)).

display the expected positive signs, and are statistically significant at the 1 per cent level, which means that the probability of exporting increases with the internationalization of the firm.

Finally, the additional variables describing the role of state ownership and the level of corruption reveal some amount of pre-transition legacy. In particular, the variable *share_gov* displays a negative sign and is statistically significant at the 5 percent level in all three specifications. Thus the involvement of state/government in firms decreases their probability of exporting. The estimates for the corruption variable generally turn out insignificant. Only in the third specification (column (3) it displays a surprising (although weakly significant) positive sign. This unexpected result is not confirmed in other estimations for smaller country aggregates.

In columns (4) - (6) we estimated the same model for the aggregate of eight MENA-countries (Egypt, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza as well as for Israel and Turkey). The estimation results for MENA countries reveal some similarities to the results for all countries in terms of signs and statistical significance of estimated parameters but only for some control variables. In particular, the estimated parameters for variables *age, R_D, luni, lsize* and *fo* have the same statistical significance and similar values of parameters.

However, there are also significant differences. In particular, the estimated parameter for the key variable in the Melitz model (2003) *lprod* is positive and statistically significant at the 1 percent level in the case of estimations with no country and sector specific effects and with country specific effects, but becomes statistically insignificant in the specification with both country and sector specific effects (column (6)). This puzzling result probably reveals large sectoral differences among firms in the analyzed countries.

Another important difference exists in the case of *folicenses* variable. The estimated parameter on this variable is statistically insignificant for MENA countries, when we control

for country and sector specific effects while for the combined sample (column (3)) it was statistically significant.

The other significant difference appears in the case of the *share_gov* variable. The value of the estimated parameter for this variable is statistically not significant in the case of MENA countries while for the combined sample it was statistically significant. This result may suggest that the role of the state is more limited in the case of MENA countries in comparison with CEE countries. Finally, the parameter of the variable *corruption* is not statistically significant for MENA, while it was weakly significant in the case of all countries.[11]

The estimations of the model for all Central and Eastern European countries are shown in columns (7) - (9) of Table 4. In the majority of cases the values of parameters and their statistical significance is very similar to the results obtained for all countries reported in columns (1) - (3). In particular, the values of parameters for variables: *lprod, R_D, luni, lsize, fo and folicenses* display similar values, expected positive signs and are statistically significant at the 1 percent level of significance when we control for both country and sector specific effects (column (9)).

There are differences only in the case of additional variables describing the engagement of state ownership and the level of corruption. Both variables, i.e. *share_gov* and *corruption*, are statistically not significant when we control for both country and sector specific effects. Thus, the involvement of state/government in firms has no statistically significant impact on the probability of exporting in the case of all CEE countries, while only some minor statistical impact was observable in the case of estimations for all states.

[11] In the appendix (Table A2) we show the estimations for direct and indirect export for MENA-8 countries (as a sensitivity test).

The estimation results for the 11 CEE countries which are currently members of the European Union (EU) are presented in columns (1) - (3) of Table 5. The same scheme was used as in Table 4 i.e., in column (1) we do not control for country and sector specific effects, in column (2) we control for country specific effects and in column (3) we control for both country and sector specific effects. The results for these countries are very similar, in terms of statistical significance, signs and values for estimated parameters, to those obtained for all countries.

In particular, the parameter for variable *lprod* becomes positive and statistically significant at the 1 percent level only when we control for both country and sector specific effects, while the variable *age* is not statistically significant in all specifications. The values of parameters for variables: *lprod, R_D, luni, lsize, fo and folicenses* display similar values, and the expected positive sign and are statistically significant at the 1 percent level when we control for both country and sector specific effects (column (3)).

A minor difference appears only in the case of two variables. The variable *share_gov* also displays a negative sign and is statistically significant at the 1 percent in all three specifications, while the level of significance was lower in the estimation for all countries. Thus the involvement of state/government in firms decreases significantly their probability of exporting. On the other hand, the *corruption* variable is not statistically significant for CEE countries who are EU members.

Table 5. The results of probit estimations for CEE members of the EU, CEE non-members of the EU and for MENA 6 countries (without Turkey and Israel)

	CEE EU members			CEE non EU members			MENA 6		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
lprod	0.00946	0.0269	0.0883***	-0.00451	0.0446***	0.0889***	0.0737***	0.0551***	0.0743*
	(0.0126)	(0.0205)	(0.0271)	(0.00725)	(0.0150)	(0.0277)	(0.00821)	(0.0169)	(0.0442)
age	-0.00259	-0.00273	-0.00404	0.00867***	0.00272*	0.00160*	0.00122	0.000134	0.000969
	(0.00258)	(0.00263)	(0.00371)	(0.00150)	(0.00160)	(0.000928)	(0.00139)	(0.00144)	(0.00218)
R_D	0.607***	0.561***	0.444***	0.588***	0.484***	0.406***	0.601***	0.456***	0.450***
	(0.0785)	(0.0804)	(0.113)	(0.0510)	(0.0539)	(0.0604)	(0.0685)	(0.0711)	(0.0701)

luni	0.0114	0.0199*	0.0345***	-0.0523***	0.0169*	0.0297**	0.00197	0.0123	0.0264**
	(0.00972)	(0.0104)	(0.0101)	(0.00811)	(0.00987)	(0.0143)	(0.00913)	(0.00980)	(0.0133)
lsize	0.237***	0.248***	0.234***	0.204***	0.258***	0.247***	0.304***	0.342***	0.321***
	(0.0245)	(0.0250)	(0.0268)	(0.0152)	(0.0160)	(0.0342)	(0.0173)	(0.0183)	(0.0434)
fo	0.579***	0.550***	0.512***	0.640***	0.482***	0.445***	0.435***	0.378***	0.347***
	(0.0868)	(0.0883)	(0.0741)	(0.0643)	(0.0681)	(0.0789)	(0.0761)	(0.0794)	(0.128)
folicenses	0.173**	0.180**	0.116	0.359***	0.325***	0.303***	0.363***	0.380***	0.411***
	(0.0760)	(0.0776)	(0.0811)	(0.0492)	(0.0520)	(0.0728)	(0.0776)	(0.0790)	(0.159)
share_gov	-0.0159**	-0.0138**	-0.0163**	-0.00303	-0.00254	-0.00170	-0.00672	-0.00686	-0.00607***
	(0.00687)	(0.00675)	(0.00749)	(0.00198)	(0.00210)	(0.00228)	(0.00412)	(0.00430)	(0.00175)
corruption	-0.0537***	-0.0215	-0.0124	0.0203	0.0217	0.0317*	-0.0281*	0.00979	0.0130
	(0.0200)	(0.0217)	(0.0157)	(0.0126)	(0.0141)	(0.0191)	(0.0148)	(0.0157)	(0.0130)
Constant	-1.354***	-1.851***	-2.160***	-1.753***	-2.610***	-2.648***	-2.625***	-2.533***	-2.695***
	(0.169)	(0.277)	(0.307)	(0.110)	(0.241)	(0.325)	(0.124)	(0.222)	(0.727)
Country effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Sectoraleffects	No	No	Yes	No	No	Yes	No	No	Yes
Observations	2,472	2,472	2,472	7,765	7,765	7,765	4,277	4,277	4,277
Log likelihood	-1404	-1371	-1161	-3083	-2845	-2721	-2171	-2033	-1974
Pseudo R2	0.107	0.128	0.261	0.116	0.184	0.220	0.153	0.206	0.230

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The results for other CEE countries which are non-members of the European Union (EU) are presented in columns (4) - (6) of Table 5. Many of those countries are former republics of the Soviet Union. The results for these countries are very similar, in terms of statistical significance, signs and values of estimated parameters, to those obtained for all countries. Minor differences appear in the following cases.

First, the variable *age* becomes positive and statistically significant but only at the 10 percent level when we control for country and sector specific effects. Second, the variable *luni* is significant at the 5 percent level which is slightly lower (for both country and sector specific effects) in comparison to the 1 percent significance in the combined sample. Third, somewhat surprisingly, the variable *share_gov* is not statistically significant. In addition, it is

worth mentioning that the *corruption* variable is statistically significant at the 10 percent level and displays a surprising positive sign, but only in this group of non-EU member countries.[12]

The results for MENA-6 countries are presented in columns (7) - (9) of Table 5. These estimations were done for six out of the eight countries (as in Table 4) with the exception of Israel and Turkey, being both the most advanced countries among the MENA countries in the process of economic development.

The results for these six countries are somewhat similar, in terms of statistical significance, signs and values of estimated parameters, to those previously obtained for all MENA countries. The major differences can be summarized as follows. First, the sign of estimator for the *lprod* variable displays a positive sign, when we control for both country and sector specific effects, although at the 10 percent level only. Second, the role of human capital (*uni*) is slightly lower in the case of MENA-6 countries, when we control for both country and sector specific effects, since the statistical significance drops to only 5 percent. Third, the variable *share_gov* reveals a negative sign and is statistically significant at the 1 percent level when we control for both country and sector specific effects. Thus, the involvement of state/government in firms located in the MENA-6 countries decreases their probability of exporting. Finally, we should note that the results for MENA-6 countries are driven mostly by Egypt, since about 50% of firms analysed in this group of countries are located in Egypt.

The robustness of the estimates obtained for aggregate country groups has been tested using the alternative estimation method - fractional logit model. The results of these estimations are presented in Table A2 in the Appendix. These results are somewhat different in comparison to those obtained by the probit model in the benchmark results presented in Table 4. In particular, the variables *lprod*, *luni*, *share_gov* and *corruption* lost their statistical

[12] In principle we should interpret this as implying that a more corrupted environment facilitates exports. On a more detailed interpretation of the role of corruption for economic activities of firms in the CEE see: Cieslik and Goczek (2015).

significance in the estimation for all countries, controlling for sectoral and country effects, while the other variables (*R_D*, *lsize*, *fo*, *folicenses*) reveal the same sign and statistical significance at 1 percent level. The fractional logit specifications made for MENA and all CEE countries show also that the number of statistically significant variables decreases as well, in comparison to probit estimations.

We also tried to analyze the role of product concentration and multi-product firms in exporting. The results of these estimations, including additional variable *multi*, are presented in Table A4 in the Appendix. We found that there are differences between MENA and the CEE countries. In particular, the multiproduct firms in the MENA countries are more likely to export, while this characteristics (*multi*) is statistically not significant in the case of exports of firms from CEE countries. This is why we made additional estimations for MENA countries.

In addition, we also tried to take into account the recent trends in the literature by differentiating between direct and indirect exports. There results of these estimations are provided in Table A3 in the Appendix. These results reveal that the firms that export their products indirectly are less efficient in terms of labor productivity, smaller, and less innovative, in comparison to those that export directly.

In the subsequent part of this section, in Table 6 we present the results of estimations for individual MENA countries. For each country we first present estimation results without controlling for sectoral effects and then the results obtained when controlling for sectoral effects. We did the estimations only for countries for which the number of observations was larger than 300. However, a large number of observations (exceeding 700 firms) was available only for Egypt and Turkey. Therefore, the results for other countries should be treated with caution. We will treat the results for all eight MENA countries as the benchmark for comparison.

The estimation results for Egypt are presented in columns (1) and (2) of Table 6. The number of observations is relatively large (2,177) and the results are similar to those obtained for the whole group of MENA-8 countries. The parameters for *lprod* and *age* are positive and statistically significant at the 1 percent level, which is in line with standard expectations, although the *age* parameter was not significant in the case of estimations for all MENA countries. The other control variables are also in line with expectations, although statistical significance of the foreign ownership variable (*fo*) is achieved only at the 10 percent level. A major difference exists in the case of the *share_gov* variable which displays a negative sign and is statistically significant at the 10% level in both specifications. Another specific, but puzzling result appears in the case of the *corruption* variable which displays a positive sign and is statistically significant at the 10 percent level.

Table 6. The results of probit estimations for individual MENA countries

	Egypt		Turkey		Israel		Tunisia		Morocco	
VARIABLES	1	2	3	4	5	6	7	8	9	10
lprod	0.144***	0.158***	0.0206	0.0212	0.140	0.139	-0.0892*	-0.00913	-0.0899	-0.0588
	(0.0257)	(0.0267)	(0.0254)	(0.0254)	(0.0877)	(0.0908)	(0.0489)	(0.0549)	(0.0550)	(0.0576)
age	0.00282	0.00566**	0.0125***	0.0104**	0.0129***	0.0137***	-0.00931**	-0.00846**	-0.00281	-0.000110
	(0.00238)	(0.00244)	(0.00438)	(0.00454)	(0.00448)	(0.00468)	(0.00419)	(0.00426)	(0.00476)	(0.00485)
R_D	0.512***	0.539***	0.0375	0.0205	1.793***	1.807***	0.699***	0.653***	0.0235	0.135
	(0.131)	(0.138)	(0.144)	(0.145)	(0.241)	(0.251)	(0.161)	(0.163)	(0.221)	(0.233)
luni	0.0204	0.0419**	0.0253	0.0265	0.0514*	0.0506*	-0.00818	-0.00264	-0.0212	0.00117
	(0.0183)	(0.0200)	(0.0196)	(0.0202)	(0.0268)	(0.0281)	(0.0311)	(0.0324)	(0.0358)	(0.0390)
lsize	0.389***	0.392***	0.369***	0.342***	0.161**	0.165**	0.311***	0.261***	0.344***	0.315***
	(0.0266)	(0.0279)	(0.0474)	(0.0499)	(0.0632)	(0.0658)	(0.0482)	(0.0503)	(0.0672)	(0.0709)
fo	0.254**	0.212*	Ommitted		0.891**	0.920**	0.752***	0.746***	0.300	0.300
	(0.120)	(0.123)			(0.390)	(0.400)	(0.181)	(0.185)	(0.230)	(0.237)
folicenses	0.680***	0.713***	0.0769	0.0163	-0.325	-0.376	0.145	0.215	0.117	0.209
	(0.126)	(0.130)	(0.116)	(0.118)	(0.322)	(0.327)	(0.245)	(0.252)	(0.217)	(0.231)
share_gov	-0.00852*	-0.00910*	Ommitted		Omitted	Omitted	-0.00345	-0.00163	0.0435	0.0531
	(0.00506)	(0.00536)					(0.00895)	(0.00907)	(0.0696)	(0.0689)
corruption	0.0426*	0.0433*	0.0780*	0.0490	0.0504	0.0628	-0.00995	0.000669	-0.0150	0.0280
	(0.0250)	(0.0256)	(0.0406)	(0.0428)	(0.113)	(0.119)	(0.0420)	(0.0429)	(0.0524)	(0.0567)
Constant	-4.335***	-4.697***	-1.708***	-2.095***	-3.704***	-3.698***	-0.0682	-0.902	-0.636	-1.501*
	(0.333)	(0.353)	(0.351)	(0.453)	(1.222)	(1.285)	(0.576)	(0.638)	(0.755)	(0.808)
Sectoral effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	2,177	2,177	719	719	410	410	576	576	319	319
Log likelihood	-805.1	-770.3	-425.6	-413.0	-172.2	-164.7	-330.4	-318.1	-167.5	-151.7
Pseudo R2	0.232	0.266	0.142	0.167	0.300	0.331	0.172	0.203	0.113	0.197

The estimation results for Turkey are presented in columns (3) and (4) of Table 6. The number of observations is relatively large (719) but the results are different to those obtained for the group of MENA-8 countries. Only two parameters for variables *age* and *lsize* are statistically significant at the 5 and 1 percent levels respectively and display the expected positive signs. The variable describing foreign ownership (*fo*) is omitted since it predicts the probability of exporting perfectly.[13] We should add that the productivity variable (*lprod*) is not statistically significant in both specifications.

The estimation results for Israel are presented in columns (5) and (6) of Table 6. The number of observations is quite small (410) but the results are somewhat similar to those obtained for the whole group of MENA-8 countries. A major difference is that the productivity variable (*lprod*) is not statistically significant in both specifications. Nevertheless, the majority of other standard control variables are statistically significant and display expected positive signs. These variables are *age, R_D, luni, lsize*, and *fo*, while variable *folicenses* is not statistically significant. It is worth mentioning that the value of the estimated parameter for the *R_D* variable (1.807 in column 6) is about three times higher in comparison to the value of the same parameter for MENA and all groups of countries. This result probably reflects the important role of domestic research, development and innovations in stimulating exports of Israeli firms.[14]

The estimation results for Tunisia are presented in columns (7) and (8) of Table 6. The number of observations is not high (576) and the results are slightly different from those obtained for the whole group of MENA-8 countries. Three control variables are statistically significant at the 1 or 5 percent levels, when we control for sectoral effects, and reveal the expected positive signs (*R_D, lsize and fo*). The variable reflecting the age of firms is

[13] The *share_gov* variable is also omitted because there were only two observations.
[14] The role of domestic research (*R_D*) is very high but the *folicenses* variable is not statistically significant. Perhaps it reflects the relative strength of domestic R&D sector in comparison to the foreign one. The parameter on *luni* is also quite high, but is statistically significant only at 10 percent level.

statistically significant at the 5 percent level but has a negative sign. This means that younger firms in Tunisia are more export-oriented. All other variables, including *lprod*, are statistically not significant.

The estimation results for Morocco are presented in columns (9) and (10) of Table 6. The number of observations is small (319) and the results are very different from those obtained for the group of MENA-8 countries. Only one parameter *lsize* is statistically significant at the 1 per cent level and displays expected positive signs. All other variables, including *lprod*, are statistically not significant. These statistically poor results are probably in part due to the small size of the sample for Morocco.

In conclusion we can state that the determinants of export performance are heterogeneous among the firms from individual MENA countries. Only one variable describing the size of company employment (*lsize*) is always statistically significant. In the majority of cases the variables reflecting foreign ownership and spending on R&D are also statistically significant. The other variables, including labor productivity are statistically significant and reveal the expected sign only for individual MENA countries. These highly differentiated results of estimations are probably due to a limited number of observations in some countries (especially Morocco).

Conclusions

In this paper we attempted to address some important questions relying for answers on a comparison of different country experiences, which carry relevant implications for policy recommendations. Namely, we tried to analyze to what extent the determinants of export behavior of companies in the MENA region are similar to the companies operating in CEE countries, which were already discussed in previous studies for these countries. We draw our

conclusions on the basis of probit estimations, being aware that fractional-logit estimations do not fully support these recommendations.

Our research confirmed that the productivity of labor, in accordance with the Melitz model (2003), affects firms' propensity to export in the MENA and CEE countries if we control for country and sector specific effects, but this key variable of the model does not seem to work in the case of MENA taken as a whole. Moreover, we confirmed that other variables such as: i) the size of the company, ii) the use of human capital and iii) the level of internationalization of firms measured by foreign ownership and use of foreign licenses, contributed to increasing propensity to export of firms in the analyzed in CEE, although less so in MENA countries.

Clearly, there are some important differences between these two groups of countries, as well. The labor productivity is a statistically significant variable in the CEE countries but not in the case of MENA countries. Also, the use of foreign technology (foreign licenses) is statistically significant in the case of CEE but not in all eight MENA countries, if we control for country and sector specific effects. The age of the company is not significant in CEE countries and significant in a majority of MENA countries (usually older companies are more export-oriented). Finally, the measures reflecting non-market economy legacy, i.e. the engagement of state ownership and corruption are statistically significant in some groups of CEE and very rarely in the case of individual MENA countries.

What are the preliminary policy implications of the above? Quite oddly, if the aim of the MENA government is to improve export performance, fighting corruption does not seem to help a lot. It seems that a policy of privatization of firms, such as the one practiced after 1989 in CEE, is not going to help much in improving export performance (maybe with the exception of Egypt). Taking for granted that firms' age is a significant variable in the case of

MENA, means over time the export performance shall improve as a result of accumulated experience.

Also, given the fact that many firm level determinants of exports are sometimes dissimilar in the CEE and MENA countries, it follows that export competitiveness of the analyzed MENA countries can be improved by development of modern education systems and facilitation of the accumulation of human capital. Financial support for research and development and innovation should have a positive impact on export performance. MENA countries should also seek to attract export-oriented foreign direct investments. On the other hand transfers of technology via licenses does not seem to work as well as in the case of CEE countries (with the exception of Egypt).

The other specificities of MENA countries should also be taken into consideration. Our estimations for MENA countries demonstrate the indirect exporters can be less efficient in terms of labor productivity, smaller, and less innovative, in comparison to those that export directly. Thus, the efficient intermediaries, can increase exporting potential of MENA countries. There are also an additional specificity of MENA countries, in comparison to the CEE ones, with respect to the product concentration. The multiproduct firms in the MENA countries are more likely to export, while this characteristic is statistically not significant for exports in the case of CEE firms. It can mean, the firms from MENA do not concentrate their exports in products in which they are most efficient. It would be desirable to investigate in-depth this phenomenon.

To sum it up, according to our estimations it appears that corruption and state ownership do not result in serious barriers to exports at present in both groups of countries. However, the situation is differentiated among individual MENA countries as discussed in the context of individual country results presented in Table 6. More in-depth studies, based on broader data bases and looking for additional determinants of exports are needed in future

research. It would also be desirable to study the direction of causality between exporting and productivity using firm-level panel data which has not been available for BEEPS V.

Also more attention should be given to the role of innovations as so far we have focused on the input side of innovations. Therefore, in future studies it would be good to study also the output side of innovation. In particular, it would be desirable to investigate separately the role of various types of innovations such as product or process innovations.

References:

Alvarez R., Lopez R.A.(2005), Exporting and firm performance: Evidence from Chilean plants, *Canadian Journal of Economics* 38, pp. 1384-1400.

Arnold JM, Hussinger K (2005): Export Behavior and Firm Productivity in German Manufacturing: A Firm-Level Analysis. *Review of World Economics*, 141(2):219–243.

Baldwin J.R., Gu W.(2003), Export market participation and productivity performance in Canadian manufacturing, *Canadian Journal of Economics* 36, pp. 634-657.

Bernard A.B., Jensen J.B. (1995), Exporters, Jobs and Wages in US Manufacturing, 1976-1987, *Brookings papers on Economic Activity, Microeconomics,* Washington DC.

Bernard A.B., Jensen J.B. (1999), Exceptional exporter performance: cause, effect, or both?, *Journal of International Economics*, Vol. 47, No.1, pp.1-26.

Bernard A.B., Jensen J.B., Redding S.J., Schott P.K, (2010), Wholesalers and Retailers in US Trade, *American Economic Review*, vol. 100(2), pp. 408-413.

Bernard A.B., Redding S.J., Schott P.K, (2011), Multiproduct Firms and Trade Liberalization, *Quarterly Journal of Economics*, vol. 126(3), pp. 1271-1318.

Blalock G, Gertler PJ (2004): Learning from Exporting Revisited in a Less Developed Setting. *Journal of Development Economics*, 75(2):397–416.

Business Environment and Enterprise Performance Survey (BEEPS) 2010, data base of The World Bank, firm level data covering the period 2002-2012.

Castellani D.(2002), Export behaviour and productivity growth: Evidence from Italian manufacturing firms, *Review of World Economics* 138, pp. 605-628.

Cieslik A.,Goczek L., (2015), Corruption and Export Performance in Post-communist Countries: Evidence from Firm-level Data, *Ekonomia journal*, 42, pp. 79-90.

Cieslik A., Michalek A., Michalek J.J., Mycielski J. (2015), Determinants of Export Performance: Comparison of Central European and Baltic Firms (2015), *Czech Journal of Economics and Finance*, 64, pp. 211-229.

Cieślik A., Michałek J., Michałek A. (2014), The influence of Firm Characteristics and Export Performance in Central and Eastern Europe: Comparison of Visegrad, Baltic and Caucasus States, *Entrepreneurial Business and Economic Review*, 2, pp. 8-18.

Damijan JP, Kostevc C (2006): Learning-by-exporting: Continuous Productivity Improvements or Capacity Utilization Effects? Evidence from Slovenian Firms. *Review of World Economics*, 142(3):599–614.

Delgado M., Farinas J., Ruano S.(2002), Firm productivity and export markets: A non-parametric approach, *Journal of International Economics* 57, pp. 397-422.

Eckel C., Neary J.P., (2010). Multi-Product Firms and Flexible Manufacturing in the Global Economy, *Review of Economic Studies*, vol. 77(1), 188-217.

European Bank for Reconstruction and Development EBRD (2010), *Transition Report 2010. Recovery and Reform.*

European Firms in a Global Economy: EFIGE (2010) *The Global Operations of European Firms. The second EFIGE PolicyReport,* Bruegel.

Fakih A., Ghazalian P. L. (2014),Which firms export? An empirical analysis for the manufacturing sector in the MENA region, *Journal of Economic Studies*, Vol. 41 Is. 5 pp. 672 – 695.

Farinas J., Martin-Marcos A.(2007), Exporting and economic performance: Firm level evidence for Spanish manufacturing, *The World Economy* 30, pp. 613-646.

Girma S., Greenaway D., Kneller R.(2003), Export market exit and performance dynamics: A causality analysis of matched firms, *Economics Letters* 80, 181-187.

Girma S., Greenaway D., Kneller R.(2004), Does exporting increase productivity? A microeconometric analysis of matched firms, *Review of International Economics,* 12, pp. 855-866.

Greenaway D., Gullstrand J., Kneller R.(2005), Exporting may not always boost firm level productivity, *Review of World Economics* 141, pp.561-582.

Greenaway D., Kneller R.(2007), Firm heterogeneity, exporting and foreign direct investment, *Economic Journal* 117, pp. 134-161.

Greenaway, D. and Kneller R. (2008), Exporting, productivity and agglomeration *European economic review* 52, pp. 919-939.

Hansson P., Lundin N.(2004), Exports as indicator on or a promoter of successful Swedish manufacturing firms in the 1990s, *Review of World Economics* 140, . pp. 415-445.

International Monetary Fund (2014), 25 Years of Transition; Post-Communist Europe and the IMF. Regional Economic Issues Special Report.

Isgut A (2001): What's Different about Exporters? Evidence from Colombian Manufacturing. *Journal of Development Studies*, 37(5): 57–82.

Mayer, T. & Melitz M.J. & Ottaviano G.I.P., (2014). Market Size, Competition, and the Product Mix of Exporters, *American Economic Review*, vol. 104(2), pp. 495-536,

Melitz, M. (2003), The impact of trade in intra-industry reallocations and aggregate industry productivity. *Econometrica* 71, pp. 1695–1725.

Pisu M (2008): Export Destinations and Learning-by-exporting: Evidence from Belgium. *National Bank of Belgium Working Paper*, no. 140.

Smets V, Warzynski F (2010): Learning by Exporting, Importing or Both? Estimating Productivity with Multi-product Firms, Pricing Heterogeneity and the Role of International Trade. *University of Aarhus, Aarhus School of Business, Department of Economics, Working Papers*, no. 10–13.

Wagner J., (2002) The causal effects of exports on firm size and productivity: First evidence from a matching approach, *Economics Letters* 77, pp. 287-292.

Wagner, J. (2012) International trade and firm performance: a survey of empirical studies since 2006, *Review of World Economics* 148,pp. 235-267.

Wagner, Joachim (2007) Exports and productivity: A survey of the evidence from firm-level data. *The World Economy,* 30, pp. 60-82

Appendix

Table A1: The number of observations (firms) in the BEEPS V data base

Country	No. of observations
Albania	360
Armenia	360
Azerbaijan	390
Belarus	360
Bosnia-Herzegovina	360
Bulgaria	293
Croatia	360
Czech_Republic	254
Djibouti	266
Egypt	2897
Estonia	273
FYR Macdonia	360
Georgia	360
Hungary	310
Israel	483
Jordan	573
Kazakhstan	600
Kosovo	202
Kyrgyzstan	270
Latvia	336
Lebanon	561
Lithuania	270
Moldova	360
Mongolia	360
Montenegro	150
Morocco	407
Poland	542
Romania	540
Russia	4220
Serbia	360
SlovakRepublic	268
Slovenia	270
Tajikistan	359
Tunisia	592
Turkey	1344
Ukraine	1002
Uzbekistan	390
W. Bank & Gaza	434
Yemen	353
Total	22449

Table A.2: Sensitivity analysis: The fractional-logit estimations for aggregate groups of countries

	All countries			MENA			CEE All		
VARIABLES	1	2	3	4	5	6	7	8	9
lprod	-0.0817***	-0.0827***	0.0107	-0.0183	-0.0311**	-0.0167	-0.0606***	-0.0414**	0.131***
	(0.00895)	(0.0101)	(0.0185)	(0.0122)	(0.0133)	(0.0257)	(0.0145)	(0.0166)	(0.0393)
age	0.00791***	0.00677***	-0.00561***	-0.00295	-0.00141	-0.00593***	0.00628*	0.00527	-0.00564
	(0.00177)	(0.00196)	(0.00163)	(0.00198)	(0.00208)	(0.00228)	(0.00327)	(0.00372)	(0.00461)
R_D	0.653***	0.680***	0.479***	0.692***	0.671***	0.588***	0.743***	0.712***	0.441***
	(0.0736)	(0.0814)	(0.0586)	(0.0971)	(0.102)	(0.0886)	(0.115)	(0.132)	(0.161)
luni	-0.0725***	-0.0703***	0.00344	-0.0228**	-0.0373***	0.0291*	-0.120***	-0.0877***	0.00772
	(0.00881)	(0.00978)	(0.0100)	(0.0111)	(0.0118)	(0.0157)	(0.0146)	(0.0167)	(0.0226)
lsize	0.270***	0.220***	0.361***	0.152***	0.228***	0.354***	0.361***	0.255***	0.359***
	(0.0197)	(0.0223)	(0.0182)	(0.0242)	(0.0261)	(0.0258)	(0.0321)	(0.0373)	(0.0453)
fo	0.922***	0.905***	0.817***	0.589***	0.561***	0.841***	1.201***	1.170***	0.980***
	(0.0891)	(0.0984)	(0.0667)	(0.116)	(0.122)	(0.101)	(0.139)	(0.159)	(0.195)
folicenses	0.401***	0.495***	0.295***	0.458***	0.625***	0.255***	0.484***	0.567***	0.610***
	(0.0714)	(0.0788)	(0.0600)	(0.0997)	(0.105)	(0.0961)	(0.108)	(0.123)	(0.151)
share_gov	-0.0131***	-0.0115***	-0.00497	-0.0118*	-0.0109	-0.00402	-0.00932**	-0.00844*	-0.00392
	(0.00321)	(0.00353)	(0.00311)	(0.00640)	(0.00671)	(0.00550)	(0.00439)	(0.00499)	(0.00619)
corruption	0.0473***	0.0196	-0.0230	-0.0222	-0.0446**	-0.0376	-0.0362	-0.0289	0.0680*
	(0.0153)	(0.0170)	(0.0169)	(0.0197)	(0.0207)	(0.0244)	(0.0254)	(0.0289)	(0.0372)
Constant	-2.053***	-1.285***	18.51***	-1.612***	-1.385***	18.07***	-2.899***	-2.530***	-4.364***
	(0.134)	(0.158)	(0.575)	(0.171)	(0.194)	(0.230)	(0.214)	(0.263)	(0.664)
sectoral effects	no	yes	yes	no	yes	yes	no	yes	yes
country effect	no	no	yes	no	no	yes	no	no	yes
Observations	16,192	16,192	16,192	5,482	5,482	5,482	10,274	10,274	10,274

*** p<0.01, ** p<0.05, * p<0.1

Table A.3: Sensitivity analysis: Probit estimations of total, direct and indirect exports for MENA countries.

	total exports			direct exports			indirect exports		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lprod	0.0490***	0.0440***	0.0528	0.0574***	0.0530***	0.0607	0.000820	0.0184	0.0255
	(0.00745)	(0.0135)	(0.0367)	(0.00785)	(0.0144)	(0.0375)	(0.00925)	(0.0153)	(0.0309)
Age	0.00196	0.00211	0.00265	0.00200	0.00177	0.00258	0.00165	0.00233	0.00245**
	(0.00123)	(0.00130)	(0.00182)	(0.00133)	(0.00140)	(0.00189)	(0.00145)	(0.00152)	(0.00105)
R_D	0.631***	0.502***	0.509***	0.523***	0.396***	0.403**	0.402***	0.367***	0.364***
	(0.0583)	(0.0601)	(0.147)	(0.0596)	(0.0614)	(0.161)	(0.0629)	(0.0646)	(0.0930)
Luni	-0.00610	0.0239***	0.0319***	0.0230***	0.0544***	0.0609***	-0.027***	-0.00177	0.00608
	(0.00732)	(0.00816)	(0.00958)	(0.00866)	(0.00986)	(0.00551)	(0.00874)	(0.00968)	(0.00757)
Lsize	0.308***	0.333***	0.306***	0.305***	0.337***	0.314***	0.133***	0.123***	0.102***
	(0.0152)	(0.0161)	(0.0399)	(0.0159)	(0.0167)	(0.0411)	(0.0175)	(0.0183)	(0.0371)
Fo	0.452***	0.487***	0.476***	0.436***	0.441***	0.426***	0.121	0.183**	0.179*
	(0.0705)	(0.0739)	(0.150)	(0.0700)	(0.0732)	(0.116)	(0.0795)	(0.0816)	(0.0950)
Folicenses	0.431***	0.245***	0.244	0.334***	0.185***	0.175	0.395***	0.188***	0.186**
	(0.0599)	(0.0630)	(0.161)	(0.0618)	(0.0650)	(0.196)	(0.0646)	(0.0684)	(0.0889)
share_gov	-0.00611	-0.00481	-0.00367	-0.00678*	-0.00570	-0.00488	0.000889	0.00203	0.00301
	(0.00385)	(0.00402)	(0.00300)	(0.00399)	(0.00409)	(0.00399)	(0.00418)	(0.00434)	(0.00516)
Corruption	-0.0431***	0.0194	0.0162	-0.0454***	0.00680	0.00110	-0.0306**	0.0271	0.0286
	(0.0124)	(0.0144)	(0.00989)	(0.0134)	(0.0157)	(0.0169)	(0.0150)	(0.0174)	(0.0288)
Constant	-2.217***	-2.451***	-2.419***	-2.583***	-3.127***	-2.419***	-1.726***	-2.452***	-2.437***
	(0.108)	(0.185)	(0.561)	(0.117)	(0.216)	(0.484)	(0.130)	(0.225)	(0.442)
Country effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Sectoral effects	No	No	Yes	No	No	Yes	No	No	Yes
Observations	5,453	5,453	5,453	5,092	5,092	5,092	5,447	5,447	5,442
Log likelihood	-2925	-2682	-2617	-2480	-2275	-2227	-1852	-1751	-1725
Pseudo R2	0.151	0.221	0.240	0.155	0.225	0.242	0.0577	0.109	0.122

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Sensitivity analysis: Probit estimations with additional "multi" variable for aggregate groups of countries.

	All			MENA			CEE All		
VARIABLES	1	2	3	4	5	6	7	8	9
lprod	-0.0130***	0.0426***	0.0728***	0.0457***	0.0438***	0.0537	-0.0255***	0.0415***	0.0949***
	(0.00448)	(0.00891)	(0.0195)	(0.00756)	(0.0136)	(0.0370)	(0.00604)	(0.0123)	(0.0205)
age	0.00676***	0.00161*	0.00139	0.00156	0.00160	0.00218	0.00794***	0.00150	0.000203
	(0.000855)	(0.000930)	(0.00115)	(0.00124)	(0.00131)	(0.00190)	(0.00129)	(0.00138)	(0.00138)
R_D	0.597***	0.493***	0.437***	0.617***	0.485***	0.488***	0.604***	0.506***	0.410***
	(0.0339)	(0.0358)	(0.0571)	(0.0590)	(0.0610)	(0.150)	(0.0428)	(0.0452)	(0.0501)
luni	-0.0281***	0.0210***	0.0310***	-0.00591	0.0230***	0.0312***	-0.0442***	0.0183**	0.0309***
	(0.00456)	(0.00530)	(0.00608)	(0.00738)	(0.00822)	(0.00915)	(0.00609)	(0.00723)	(0.00895)
lsize	0.258***	0.291***	0.270***	0.314***	0.340***	0.312***	0.206***	0.260***	0.248***
	(0.00957)	(0.0103)	(0.0246)	(0.0154)	(0.0162)	(0.0370)	(0.0129)	(0.0136)	(0.0251)
fo	0.586***	0.481***	0.455***	0.459***	0.487***	0.478***	0.692***	0.485***	0.441***
	(0.0408)	(0.0432)	(0.0640)	(0.0712)	(0.0747)	(0.161)	(0.0511)	(0.0542)	(0.0483)
folicenses	0.321***	0.254***	0.237***	0.419***	0.236***	0.234	0.297***	0.260***	0.233***
	(0.0333)	(0.0355)	(0.0589)	(0.0602)	(0.0635)	(0.157)	(0.0415)	(0.0438)	(0.0489)
multi	0.00141***	0.000467	0.000976	0.00298***	0.00359***	0.00409***	0.00181***	-0.000951	-0.000556
	(0.000520)	(0.000571)	(0.000888)	(0.000939)	(0.000992)	(0.000984)	(0.000654)	(0.000716)	(0.00102)
share_gov	-0.00775***	-0.00498***	-0.00446***	-0.00643*	-0.00522	-0.00415	-0.00512***	-0.00420**	-0.00352*
	(0.00169)	(0.00178)	(0.00158)	(0.00387)	(0.00403)	(0.00300)	(0.00191)	(0.00200)	(0.00184)
corruption	-0.00907	0.0130	0.0182*	-0.0466***	0.0158	0.0121	-0.00212	0.0149	0.0263**
	(0.00774)	(0.00914)	(0.00943)	(0.0125)	(0.0146)	(0.0132)	(0.0107)	(0.0119)	(0.0127)
Constant	-1.592***	-2.317***	-2.543***	-2.218***	-2.536***	-2.526***	-1.360***	-2.524***	-2.612***
	(0.0671)	(0.137)	(0.272)	(0.109)	(0.190)	(0.561)	(0.0894)	(0.208)	(0.227)
Country effects	no	yes	yes	no	yes	yes	no	yes	yes
Sectoral effects	no	no	yes	no	no	yes	no	no	yes
Observations	15,741	15,741	15,741	5,373	5,373	5,373	10,001	10,001	10,001
Log likelihood	-7682	-6928	-6580	-2876	-2633	-2565	-4523	-4146	-3851
Pseudo R2	0.126	0.212	0.252	0.153	0.224	0.244	0.115	0.188	0.246

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1