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in the Middle East and North Africa**

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International Entrepreneurship and Technological Capabilities in the Middle East and North Africa

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Abstract. In this paper we investigate the extent of international entrepreneurship in Algeria, Egypt, Morocco, Oman and Syria using a dataset covering 3,281 firms. We find that weak technological capabilities constrain internationalization. Firms with ISO accreditation, an own website, and those who have introduced new technology have a higher probability of entering export markets than otherwise. Firms in high-tech sectors are more likely to export early. However with foreign shareholding this advantage of high-tech firms disappears. The results suggest that early international entrepreneurs may need to pay more in informal payments if they want to increase the share of their exports once they have entered into export markets. We derive implications for policy and further research.

JEL classification codes: L26, L25, M16, O55, F23

Key words: International entrepreneurship, exports, entrepreneurial capabilities, innovation, Middle East, North Africa, MENA

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1 Introduction

International entrepreneurship is the ‘discovery, enactment, evaluation, and exploitation of opportunities—across national borders—to create future goods and services’ (Oviatt and McDougall, 2005: 540). The extent of firm internationalization refers to either the size or share of a firm’s exports as well as the speed with which it is able to internationalize. Through cross-border opportunities international entrepreneurs can contribute towards domestic learning, facilitate the transfer of knowledge and technology, and increase overall levels of productivity in an economy – directly and through positive spill-over effects. A positive relationship has been found between the extent of internationalization of a country’s firms and its economic growth (De Ferranti *et al.*, 2002; Al-Marhubi, 2000; Herzer and Nowak-Lehmann, 2006).

Although most of the empirical evidence for the benefits and determinants of international entrepreneurship comes from advanced economies, the literature on international entrepreneurship in other economies - especially in Asia, Sub-Sahara Africa and Latin America - is growing fast. It tends to find similar positive effects from international entrepreneurship (Funke and Ruhwedel, 2005; Matthee and Naudé, 2008; Naudé, 2009). The exception to the trend of growing research into international entrepreneurship is the Middle East and North African (MENA) region. In contrast to other developing regions, including Sub-Saharan Africa, there is no established literature on international entrepreneurship in this region.

Despite substantially improved trade openness and trade integration in the MENA region since the beginning of the 1990s, economic performance has been elusive and the anticipated benefits from access to larger markets, newer technologies and stronger competition did not materialize (Brach, 2007; 2008; 2009). And despite its geographic proximity to markets in both Europe and Asia, international integration outside the energy-producing sector also remained relatively low.¹

¹ The MENA region has a favourable geostrategic location. Spread across Asia, Africa, and Europe, MENA countries are at the crossroads of and the link between these three continents. The MENA region is within the close neighbourhood to the economic hub and big internal market of the EU. This is favourable both in terms of export markets as well as access to recent technologies and low transportation costs.

The intriguing question is why despite its geographical location, and initiatives at improving trade openness, international entrepreneurship in the MENA region remains much more limited than elsewhere? What are the factors hampering international entrepreneurs? To what extent are these factors related to entrepreneurial capabilities, or to weak technological capacities?

In this paper we attempt to provide an answer to these questions using a firm-level dataset covering 3,281 firms across five countries: *Algeria, Egypt, Morocco, Oman and Syria*. We focus in particular on the relative importance of entrepreneurial capabilities (measured through entrepreneurial orientation, experience and education) and technological capacities (measured through the extent of innovations and technological advances) for international entrepreneurship in the region. Considering the particular challenges that the region is facing, the technology/entrepreneurship nexus will be even more important than ever before.

The remainder of the paper is structured as follows. In section 2 we introduce the main theoretical framework of international entrepreneurship and technological capacities. In section 3 we focus on the MENA region and discuss its technological capacities, stress the importance of international entrepreneurship and technology for the region to address its development challenges. We also provide a short profile of the selected MENA countries. Drawing on the literature review in the preceding sections, we outline the research hypotheses as well as the data and methodology in the sections 4 and 5. Section 6 presents and discusses our empirical results. Section 6 summarizes our main findings and concludes.

2 Literature Review

2.1 International Entrepreneurship

Firms can internationalize through exporting and/or by establishing a physical presence abroad. In this paper we mainly focus on internationalization through exporting. Two main schools offer (not mutually exclusive) explanations and describe the motivation and mechanism behind firm internationalization.

Almost 40 years ago, Johansen and Vahlne described the ‘process model of internationalization’ (PMI) (see Johanson and Vahlne, 1977) and pointed to the fact that internationalization was costly and difficult to manage. Firms’ therefore first need to gain experience, accumulate

resources and master a large domestic market share before venturing abroad. Hence all models in this tradition share that internationalization is largely reactive and characterized by inertia (Autio et al., 2000).

The resource-based view, also called international new venture theory (RBV/INV) of the firm by Oviatt and McDougall (see Oviatt and McDougall, 2005) follows a different perspective. In this view internationalization depends on the capabilities and assets of a firm (Westhead et al., 2001) in conjunction with the firm's strategic intent. Thus firms may go international to protect intellectual or other capital/advantages, or to secure technologies for domestic use, or to obtain scale economies. A constraining domestic market is considered to be an important push-factor as internationalization may be a strategic move to escape restrictive domestic conditions. According to the RBV/INV-theory, internationalization reflects strategic intent by firms, and that there are various moderating and mediating factors, such as the external environment and that strategic capabilities of the entrepreneur. Oviatt and McDougall (2005) hence classify the determinants of internationalization into *enabling*, *motivating*, *mediating* and *moderating* factors.

Enabling factors include a firm's technological (or knowledge) intensity, the information and communication technologies (ICT) used, and the costs of transport/logistics. These factors have been widely recognized as being important reasons why firms are increasingly venturing into international markets and are doing so at an earlier age (see e.g., Wright and Etemad, 2001).

Motivating factors for internationalization refer to industry-specific and more general (framework) conditions for doing business, as well as institutional features the 'rules of the game' in the country and region where the firm operates. If the industry is characterized by easy access and a high degree of competition, a firm may wish to internationalize (and internationalize sooner rather than later) in order to capture a larger market share (Alon and Lerner, 2008). The general conditions and the institutional and political economy structures within which the firm operates influence its enablement or obstruction to its international expansion. Thus, a less conducive business and institutional environment where firms may face a heavy regulation burden, insufficient protection of property rights, high levels of corruption, a weak capital market and insufficient business infrastructure is often found to be associated with fewer new start-ups as well as slower firm growth (e.g., Fonseca et al., 2001; Klapper et al.,

2006; Shaw and Darroch, 2004). These factors, by impacting negatively on the allocation of the resources and capabilities of a firm, and even more so on those of SMEs, will limit the speed and extent to which firms can internationalize. However, these may also act as motivating factors for firms wanting to escape the burdensome domestic environment (Witt and Lewin, 2007).

Mediating factors are factors inherent to the entrepreneur. Thus, the entrepreneur's experience, background and education are found to play an important role in whether or not a firm internationalizes (De Clercq and Bosma 2008; Zucchella et al., 2007; McNaughton, 2003). More generally, the concept of entrepreneurial orientation is noted to relate significantly to the internationalization of a firm. Entrepreneurial orientation (EO) or entrepreneurial 'proclivity' is the 'global mindset' or 'strategic posture' of the entrepreneur and has been measured through his or her innovativeness, competitiveness, and pro-activeness (Tang et al. 2008; Acedo and Jones, 2007; Zhou 2007). According to Jantunen et al. (2005), EO allows firms to be 'better able to reconfigure their assets and business processes', in other words it is a good indicator of the 'dynamic capabilities' that are needed in order for firms to adjust to different environments.

Moderating factors include factors such as knowledge, learning and networks. These factors are central determinants of internationalization in all theoretical approaches, including the PMI and the INV theory. Firms delay internationalization due to a lack of knowledge and experience, and when they do internationalize, it is first towards markets that are more similar, especially in terms of cultural affinities. An extension to these models (e.g., Johanson and Mattsson, 1988) argued that networks assist firms to overcome the disadvantages of knowledge and experience of foreign markets. Although networks are also important, the INV theory does not consider a firm's newness or smallness to be an automatic disadvantage in internationalization. For instance, Autio et al. (2000) argue that a firm's newness can be an advantage, in that young firms may be better able to learn from internationalization being more flexible and not having become burdened by particular routines.

2.2 Technological Capabilities

In the previous section we noted that a vital enabling factor for international entrepreneurship is the technological capabilities of firms. While it is straightforward to understand how ICT (such as the internet) and transport/logistics enable or facilitate international expansion (see e.g. Naudé

and Matthee, 2007), a firm's technological capabilities may also be an important factor. This is due to three main reasons.

First, the need of firms with high research and development (R&D) expenditures to increase the returns on their investment, as well as to ensure that they can appropriate the benefits from their innovations. Especially high-tech firms and more innovative firms are noted to internationalize earlier than medium or low-tech firms (Autio et al., 2000; Li, 2001; Zucchella et al., 2007).

The second reason for the importance of a firm's technological capabilities is the increased importance of external partners as sources for new knowledge and technology. As recently stressed by the OECD (2009: 15) 'supply chains are critical sources of new knowledge and learning for firms...firms developing more radical or complex innovations are more likely to have co-operative arrangements for innovation with external partners along the supply chain than less innovative firms'. Hence while innovative firms may more easily break into global supply chains, international trade – exporting and importing – is an important determinant in itself of innovation. Because over 90 per cent of new technologies are developed in OECD countries, firms in developing countries cannot alone rely on local or national interaction in order to access new and recent technologies, they have to internationalize.

The third reason is the potential of technology transfer through internationalization. Access to technologies and knowledge is important, but a successful transfer is crucial for positive spillovers for local firms. Obviously, embedded (new) technologies or knowledge can be transferred when new equipment or machinery, or blue print/patents are purchased. However, there are other forms of transfer. International supplier or buyers may provide technology and knowledge to their value creation partners, trade agreements may explicitly provide for facilitated private sector tech transfer (Juliane Brach, Robert Kappel 2009).

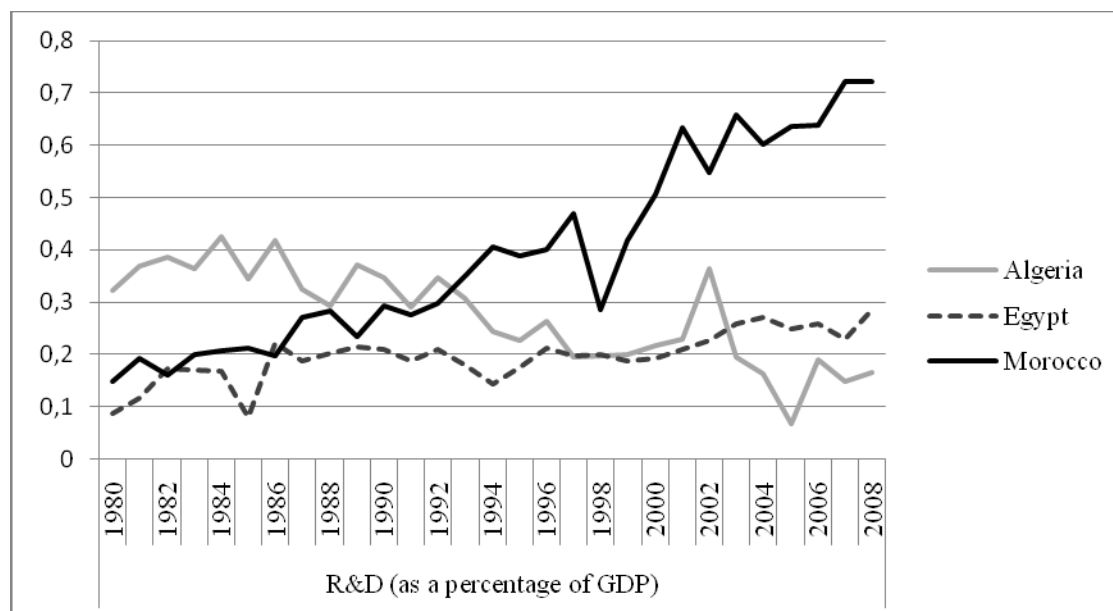
3 The countries of the Middle East and North Africa

3.1 Technological Capacities

With respect to the MENA region all arguments certainly apply, however, to different extents and especially the first two are less important. Very few MENA firms in MENA countries

operate the high-technology sector and the spending on research and development is comparatively low.

Figure 1: Spending on R&D (as % of GDP) in Algeria, Egypt and Morocco, 1980-2008



(Source: Authors' compilation based on data from Castellacci and Natera, 2011)

Figure 1, depicts that R&D spending in the three show cases Algeria, Egypt and Morocco is less than 1 per cent of GDP. Only Morocco displays a strong upward trend apparent. In Egypt and particularly in Algeria, R&D spending has been stagnant over the twenty-year period. This argument is perhaps less important here. And indeed, as much as in other parts of the developing world is innovation thus much closer related to the use, adoption and refinement of already existing technologies (diffusion-based innovation) than to the development of new technologies (World Bank 2010; Soete 2008).

In contrast, the third argument is vital: Technology transfer or rather the lack of technological capabilities can be an important explanation for the disappointing economic performance of the MENA region. Recent studies find that rather than the usual deep determinants of economic development such as geography, conflict or limited trade integration, technology (and political economy) are the more serious constraints on economic development in the Arab countries

(Brach 2009). In particular, With respect to technological capacities, MENA countries can be broadly classified in four groups (see Table 1 below).

Table1: Technological Capacities in the MENA Region

	Access (recent technologies are generally available)	Adoption (available technologies are applied efficiently)	Development (development of new-to-country technologies)
Technology Developer: Israel, Iran, Turkey	++	++	++
Technology User:			
<i>Consumer:</i> Bahrain, Qatar, Kuwait, Oman, Saudi Arabia, United Arab Emirates	++	++	-
<i>Integrated User:</i> Tunisia, Jordan, Egypt, Morocco, Lebanon,	++	+/-	+/-
<i>Isolated User:</i> Algeria, Syria, Palestinian Territories, Yemen, Libya, Iraq,	-	+/-	--

(Source: Brach 2010).

The technology *developers* are technologically well advanced countries that are characterized through excellent access to, mastering and development of new technologies, through both research and technology adaption. Countries within this group in the MENA region are Israel, Turkey and partially Iran. All three have invested early and systematically into education and the development of national innovative, science and research capacities. They equally profit from well-educated nationals returning to their home country.

The majority of MENA countries, including all Arab countries in the region are however classified as technology *users*. Countries in this group use and apply above all foreign-developed technologies, and only to a very limited extent develop or improve technologies according to their needs. Within this group, three different subgroups of users can be differentiated: consumers, integrated users and isolated users. The *consumers* are highly integrated into the global market and thus have access to international state-of-the-art technologies. *Consumers* do not possess the necessary skills, but are in funds to equip themselves with both the technologies and the experts to run it. All six members of the Gulf Cooperation Council (GCC: Bahrain, Kuwait, Oman, Saudi Arabia, United Arab Emirates, and Qatar) typically fall into this group. The *integrated users* have in less than 15 years systematically improved their integration into the

global markets through trade opening improved. Today all countries in this group enjoy a very good access to international technologies. However, their purchasing power is relatively limited and much less consumption of technology is possible as in GCC countries. But despite better access to technologies and increased trade integration, have neither the more advanced integrated users, like Tunisia or Jordan, nor Egypt or Morocco in the past ten years experienced the significant productivity improvements. This partially contradicts the positive effects of trade opening that was observed in other developing regions. Recent studies show, that these countries are probably have too low technological capacities in order to better exploit the new (technological) possibilities and internalized the positive effects of an improved access to technologies (Brach, 2009). The *isolated users* face the most difficult situation. Their integration into the world market is both fairly recent and selective as in Syria, Algeria and especially Libya or sustainably destroyed because of ongoing war and conflict as in Iraq and the Palestinian territories. Countries in this group lack the capacities, the funds and most of the basic infrastructure.

Due to data constraints, we are not able to pursue an in-depth analysis of the entrepreneurial and technological capacities of all MENA countries. However, the selected countries represent all user group subcategories: The isolated users are represented by the countries Algeria and Syria, the integrated users are represented by Egypt and Morocco, and finally the consumers are represented by Oman. As such, despite the limited scope of countries, the results of this analysis can indeed be interpreted at the regional level, and will be reiterated after a more detailed introduction of the five selected countries.

3.2 Selected Country Profiles

In this subsection, we provide a short macro-overview of the five MENA economies where the surveys were carried out – with a particular focus on their growth, productivity and aggregate innovative and entrepreneurial profiles. Table 2 shows that the countries in our sample range from a geographically small country with a small population (Oman) to large countries with large populations (Algeria and Egypt). The countries in the sample are mostly lower-middle income countries, with the exception of Oman which can be classified as an upper-middle income country. Hence GDP per capita ranges from around US \$ 1330 in densely populated Syria to US \$ 9,978 in relatively urbanized Oman. Manufacturing value added is highest in

Egypt and Morocco and the lowest in Syria. Oman is the most open economy, generating 96 of GDP in the form of trade and almost 8 per cent of GDP from FDI. Manufacturing exports ranges from a low of only 1.53 per cent of merchandise exports in the case of Algeria to 66 per cent in Morocco. All countries in the sample are significantly dependent on imported manufactured goods.

Table 2: General Macro-economic Profile of Sample MENA Countries

General	Algeria	Egypt	Morocco	Oman	Syria
Surface area (sq. km)	2,381,740	1,001,450	446,550	309,500	185,180
Population, total (2008)	34,373,426	81,527,172	31,605,616	2,785,361	20,581,290
Trade (% of GDP) (2008)	71.03	71.92	86.95	96.08	62.92
Exports of goods and services (% of GDP) (2008)	47.51	33.15	36.70	55.90	31.35
Manufactures exports (% of merchandise exports)	1.53	36.64	66.76	7.28	34.77
Manufactures imports (% of merchandise imports)	74.88	59.29	61.35	79.92	47.57
GDP per capita (constant 2000 US\$) (2009)	2,190	1,786	1,718	9,978	1,330
Manufacturing, value added (% of GDP)	4.63	15.73	14.04	8.29	12.82
Rural population (% of total population)	34.78	57.28	43.98	28.38	45.78
Foreign direct investment, net inflows (% of GDP)(2009)	1.59	5.85	2.77	7.50	3.06
Average annual GDP growth (1980-2009)	2.61	4.88	3.65	6.32	4.11

(Source: Authors' compilation based on World Bank's World Development Indicators, Online)

What can we tell from aggregate data about the entrepreneurial and innovative performances and characteristics of these countries?

Table 3 compares a number of entrepreneurial indicators in the context of international trade. It shows that new business start-up activity is relatively variable, ranging from only 2.6 per cent in Egypt, to 16 per cent in Oman. The largest numbers of formally registered businesses are found in Egypt, while most firms in Syria appears to be informal. The variability in start-up rates and low numbers of formally registered businesses may be indicative of difficult environments for entrepreneurs. This is borne out by the fact that all the countries in the sample do poorly in terms

of the World Bank's 'Doing Business Index'. It can be seen from the table that all countries apart from Oman are ranked more than 100th position in the world. The cost of starting a business seems to range from 2 per cent of GNI to 27 per cent in Syria (also the country with seemingly the largest informal sector). Many procedures need to be followed to start up a business and to enforce a contract or to register property; the legal rights index is relatively weak in all countries, and only a small proportion of firms use banks to finance investment.

The speed and extent of internationalization varies significantly across the countries. Both the membership and the WTO membership and the speed of concluding Euromed Association agreements (a process that started 1995 and was expected to finished by 2005: Brach 2007) are important indicators. Syria and Algeria only recently started to integrate with the world market. Their participation in the global economy was for a long time limited to the oil sector. In both countries, the disintegration with the global economy was for political reasons. However, while Syria opted out of the socialist system and close ally of the Soviet Union, Algeria was banned and faced severe embargos from the western world as a consequence of terrorist actions. Algeria can be characterized as a fuel-dependent, energy exporter with close ties to EU, especially France, where most of the remittances stem from.

In contrast, Morocco is a non-fuel exporter, but also has strong ties to Europe, Morocco was among the first to sign and ratify Euro-Mediterranean free trade association agreements and is a long-standing WTO member. Finally, Egypt is a net energy exporter, but imports about energy much as it exports. The economy is substantially diversified, well integrated with very strong ties to the US as their ally, since the Egyptian Israeli peace treaty.

Oman has very high per capita energy reserves a high financial buffer, but little local technological competence. The rapidly growing population is also in this county a challenge to economic growth. An effort to diversify the economy was made mainly build on tourism.

Table 3: International Entrepreneurial Profile of Sample MENA Countries

International Entrepreneurial Environment	Algeria	Egypt	Morocco	Oman	Syria
Business entry rate (new registrations as % of total) (2007)	10.14	2.61	Na	16.37	9.52
Total businesses registered in 2008 (number)	105,128	367,559	Na	38,864	2,268
Ease of doing business index (1=most business-friendly regulations)	134	106	128	65	143
Start-up procedures to register a business (number)	14.00	6.00	6.00	5.00	7.00
Strength of legal rights index (0=weak to 10=strong)	3.00	3.00	3.00	4.00	1.00
Cost of business start-up procedures (% of GNI per capita)	2.71	16.10	16.10	2.20	27.80
Domestic credit to private sector (% of GDP)	13.51	42.94	77.44	35.93	15.63
Firms using banks to finance investment (% of firms)	8.88	5.57	12.29	30.99	7.62
Firms with female participation in ownership (% of firms) % of male senior management	15.03	33.96	13.12	na	na
Procedures to enforce a contract (number)	47.00	41.00	40.00	51.00	55.00
Procedures to register property (number)	14.00	7.00	8.00	2.00	4.00
Logistics performance index: Overall (1=low to 5=high)	2.06	2.61	2.38	2.84	2.74
Lead time to export, (days)	17.00	14.00	14.00	22.00	15.00
Cost to export (US\$ per container)	1,248	737	700	821	1,190
Documents to export (number)	8.00	6.00	7.00	10.00	8.00
Labour force with tertiary education (% of total)	10.00	Na	8.70	13.80	6.30

(Source: Authors' compilation based on World Bank's World Development Indicators, Online)

Table 3 also suggests that it is difficult for entrepreneurs to export from MENA countries. The cost to export is relatively large compared to average global and regional figures, for instance it costs more than 1,000 USD to export a container from Algeria and Syria. The lead time to export is at least two weeks, and the logistic performance index would suggest an average performance at best for countries in the region. Educated labour seems to be a potential shortcoming, with less than 10 per cent of the labour force having a tertiary qualification in most countries.

As far as innovation and technological performance is concerned, Table 4 suggests a relative low technological intensity in production and consumption. The region is a net-importer of technology. For instance in all cases except for Morocco, the percentage of exports consisting of

high-technology products is less than 1.50 per cent of all manufactured exports. Similarly, ICT goods amounts to at best 5 per cent of total goods exports (in the case of Morocco) and is basically absent from Algeria's export. The Table 4 also shows that there is only between 10 and 33 internet users per 100 people, that only a small proportion of firms have ISO certification. In terms of mobile phone penetration however countries, apart from Syria, seems to perform better, with at least half to 90 people out of a 100 having access.

Table 4: Innovation and Technology Profile of Sample MENA Countries

Innovation and Technology Profile	Algeria	Egypt	Morocco	Oman	Syria
High-technology exports (% of manufactured exports)	0.71	0.97	8.81	0.73	1.27
ICT goods exports (% of total goods exports)	0.00	1.81	5.73	1.60	0.56
Information and communication technology expenditure (% of GDP)	2.31	5.70	12.45	na	na
Internet users (per 100 people)	10.34	16.65	33.04	20.00	17.32
ISO certification ownership (% of firms)	4.98	21.09	17.28	10.78	7.39
Mobile cellular subscriptions (per 100 people)	92.72	50.62	72.19	115.58	34.28

(Source: Authors' compilation based on World Bank's World Development Indicators, Online)

The picture emerging from the three tables in this section suggest that the MENA countries in our sample are developing (middle and lower middle income) countries with small manufacturing sectors, dependent on imported manufacturing goods. Exports, and entrepreneurial activity in exports (and in general) seem to be constrained by high export costs, weak logistics and inadequate trade facilitation standards, as well as high costs of registering a business, involved procedures, and cumbersome procedures for registering property and enforcing contracts.

Taken together, it is therefore perhaps not surprising that the technological sophistication of exports is very low, and that the minority of firms in each country possess ISO accreditation. Overall Morocco seems to be the most sophisticated country in terms of innovation and technology, but not in terms of the ease of doing business or entrepreneurial climate, in terms of which it seems to follow Oman (perhaps the most entrepreneurial) and Egypt.

4 Research Hypotheses

In this paper we argue that the lack of technological capabilities may be one of the most significant reasons for the low internationalization of MENA-firms. Against the theoretical

background and the regional characteristics presented in section 2 and 3, we will now formulate and explain the two hypotheses to guide our empirical investigation.

Hypothesis 1: Enabling Factors (technology): Firms in the MENA-region are relatively more constrained in terms of entering export markets and the extent of subsequent exports by enabling factors such as technology and by motivating factors such as institutional weaknesses, than by mediating factors such as entrepreneurial capabilities.

In other words, lacking enabling factors, especially technological capacities are expected to have a negative impact on international entrepreneurship. In contrast, *improved* technological know-how will therefore facilitate the speed with which firms in the MENA-region internationalize to a greater extent those entrepreneurial capabilities.

Hypothesis 2: Motivating (institutional features and general conditions) and mediating factors (entrepreneurial orientation): The institutional and general business environment and entrepreneurial orientation or mindset does not limit entrepreneurship in general, but constrain international entrepreneurship significantly.

The reason could be the lacking compatibility of the regionally predominant mindset with international economic and incentive structures. With respect to the political economy and incentive structures that are prevailing in the MENA region (and in many other, especially politically and economically non-free, parts of the developing world), the typology has to be extended and modified to match the context. Successful entrepreneurship depends much more on very different non-market factors and such entrepreneurial orientation (EO) in the MENA region. I.e. the ‘global mindset’ or ‘strategic posture’ of the entrepreneur in this given context and has to be measured through the extent of networks and personal relations, the ability to seek rents and establish patron-client relationship in addition to his or her innovativeness or competitiveness. EO can change as the institutional environment changes; this can be the case through sudden shocks or gradual change. However, the farther away from “western-style”, market-oriented and merit-based reward systems; the more important it is to know the informal “rule of the game” and how to exploit these. This in return causes extremely high internationalization costs. Firstly, because EO of local entrepreneurs may only partially be compatible in an international context

and secondly, the entry costs for non-insiders are very high. This reduces local entrepreneurial dynamics (often drives initiatives to operate informally) and foreign investment/engagement.

5 Data and Methodology

Our sample of 3,281 firms comes from the following MENA countries: Algeria (557), Egypt (977), Morocco (850), Oman (337) and Syria (560). Firms were surveyed in Algeria in 2002, in Egypt and Morocco in 2004, and in Oman and Syria in 2003 as part of the World Bank's 'Productivity and the Investment Climate Private Enterprise Survey' (PICS).

The questionnaire covered general information, sales and supplies, investment climate constraints, infrastructure and services, finance, business-government relations, the legal environment, crime, capacity, innovation and learning, and labour relations and productivity.

More information on the sampling methodology can be obtained from the World Bank's website at http://siteresources.worldbank.org/INTPSD/Resources/336195-1092412588749/pics_manual.pdf.

From the survey we selected those variables that provide most direct proxy for the various determinants of a firm's internationalization related to the theoretical framework presented in section 2. The variables selected are listed in Table 5.

Table 5: Determinants of firm internationalization and its measurement in the current survey

Category	Typical Determinants	Relevant Variables / proxies from survey
Internationalization	Speed and extent of firm- and exporting activities	Exporting or not (c211a1), % exported sales (c211a1), age at which started exporting (c211c1).
Enabling factors	Technological intensiveness, use of information and communication technologies (internet).	Licensed technology (c254, c2588), sophistication of production technology (c256), ISO certification (c257), new technology (c2584), own website (c224b), spending on R&D (c280).
Motivating factors	Institutional features	Informal payments (bribes) (c239)
Mediating factors	Entrepreneurs' capabilities, perceptions, background	Highest level of education of top-manager (c271), past experience in foreign firms, (c273), age of the firm (c201).
Moderating factors	Knowledge, networks. Learning.	Member of business association (c225), informal payments (c239, c240, c243), lobbying activities (c244, c245).

Source: Authors' own compilation, based on Oviatt and McDougall (2005) and Naudé and Rossouw (2010).

The appendix contains summary statistics pertaining to these variables.

We are interested in estimating the determinants of the extent to which firms in the MENA region export (internationalize). However, not all firms export in the first place. Because the dependency of the share of exports on the decision to export or not in the first place, the use of ordinary least squares estimators would result in biased estimates. To avoid this, we use the Heckman two-step selection estimator which is particularly appropriate in the present case. Not only does it take the first stage of deciding on whether or not to export in consideration when estimating the determinants of the shares of exporting, but it also corresponds to the notion that firms go through stages in the internationalization process (Naudé and Rossouw, 2010).

Thus we can take into account the fact that there is a difference between the probability that a particular firm will export (which is termed the selection stage), and the level of exports once there are positive exports (which is termed the outcome stage). The latter corresponds to later stages in the export development/internationalization process. Firms select to export, and then decide how much to export; as they gain more experience, they will be entering export markets in a more committed manner (Matthee and Naudé, 2008).

Testing for the determinants of the speed with which MENA firms internationalize, we likewise define a discrete variable which equals 1 if a firm started exporting before three years of age, and =0 if otherwise. Hence given this discrete dependent variable, a Heckman two-step sample selection estimator is the most appropriate. In this respect, our estimating strategy is based on that of Naudé and Rossouw (2010).

6 Empirical Findings

We first provide a general summary of the firm characteristics. Thereafter, we present the results from qualitative analysis of the firms' profiles with respect to entrepreneurship, international trade, and innovation and technological in depth. Finally, we summarize and interpret the results from the regression analysis exercises.

6.1 General Firm-Level Findings

Table 6 summarizes some of the general characteristics of the firms in the sample. This shows importantly that the World Bank's survey has been of large firms – average firm size across the sample is 94, ranging from 40 in Syria to 138 in Morocco. Hence our study will not be able to pick up on the dynamics of innovation and technology in informal, small and micro-sized firms, a large and relatively important sector of these countries' economy.

Table 6 also shows that the typical firm has been operating for 26 years. Many studies take firms with more than 20 employees and that has been in existence for more than five years as 'high-growth' firms, hence we may conclude that the sample of firms we are investigating are perhaps representative of the most *dynamic* firms in the MENA region. But since, most of the firms in the region are rather small (and micro) enterprises; the sample is not representative for all firms in the region. Many large private firms may be formerly state-owned enterprises that have ended up controlled by entrepreneurs close to the ruling elite. Size and age may thus be in this region a much more limited indicator of dynamism and competitiveness than in OECD focused studies.

Table 6: General Profile of Firms in the Sample

	MENA	Algeria	Egypt	Morocco	Oman	Syria
Average firm size	94	58	126	138	35	40
Average firm age	26	38	27	na	16	16

% of firms with foreign shareholders	8%	0.90%	3.90%	19%	15%	1%
% of firms previously government owned	3.50%	3.90%	4.20%	na	1%	na
% of firms with foreign holdings	3.90%	3.30%	Na	2.20%	8.50%	4.50%
% of firms member of business association	58%	50%	Na	65%	na	na
Average capacity utilization of firms	64%	60%	65%	66%	69%	62%
Average no of days of inventory in stock	44	44	36	47	na	52
Average employment growth past three years	-0.30%	-7.60%	3.10%	-0.50%	2.40%	3.14%
N		557	977	850	337	560

(Source: Compiled from World Bank data)

The nature of firms does differ somewhat between countries in the region, as Table 6 suggests. For instance in Morocco almost one in five (19%) firms have foreign shareholders. In Egypt, more than 4 per cent of firms were earlier fully government owned. Around 8 per cent of firms in Oman have holdings (business interests) in foreign countries. Where firms do seem to have features in common, these include relatively high number of days of inventory in stock (on average 44 days' worth), only around half of firms belonging to business associations. Most business associations are co-opted, i.e. under direct or indirect control of the state system. All grass-root organizations have to apply for permission, which is often not granted. In other cases elite circles do not grant membership other than by recommendation and/or appointment.

Capacity utilization rates seem to be very low - in the 60 per cent. Interestingly there is comparatively little variation across the countries. This could be both to mismanagement or low productivity and inefficient use of technologies. An international comparison would be interesting.

Table 6 provides one measure of firm performance: employment growth over the three years preceding the survey. It indicates a diverse experience. Highest average employment growth has been in Syria and Egypt (around 3 per cent) whereas employment shrunk by around 7 per cent in Algeria. The survey covers the immediate post 9/11 period were the region experience a very

sharp cut set back in trade relations, especially in tourism and consumption of goods from the region.

6.2 *Firm Internationalization*

The profile of firm internationalization in the sample is summarized in Table 7. On average, around 25 per cent of the firms export, however there is considerable variation across countries. Algeria's and Oman's firms are the least internationalized – only 4 and 9 per cent of firms export here, respectively. Morocco and Syria are the countries where firms tend to be the most internationalized with 50 and 31 per cent of exporting firms, respectively. This finding is very puzzling and contradicts, again, other data. This indicates that the sample of firms differs significantly across industries and sectors. Especially the ranking of Syria cannot be considered representative. Syria is the least, and latest integrated of all MENA countries, and the majority of internationalized firms are concentrated within the oil sector.

Table 7: Profile of Firm Internationalization in the Sample

	MENA	Algeria	Egypt	Morocco	Oman	Syria
% Firms exporting	24.70%	4.30%	15.50%	50.40%	9.70%	31.40%
Average % of sales directly exported	16.29%	58.60%	6.60%	44%	4.15%	12.70%
Average % of sales indirectly exported	2.91%	10.70%	1.70%	4.70%	0.60%	6.39%
Average age at which started exporting	7 years	4 years	10 years	na	5 years	8 years
% Firms exporting before age 3	56%	78.50%	51%	na	61%	48.40%
% of inputs and supplies imported directly	27.50%	Na	12.90%	50.30%	21.70%	21.90%
Average no of days of transport failures	7 days	na	na	4 days	8 days	na
Average number of days for exports to clear	4 days	9 days	5 days	2 days	4 days	6 days

(Source: Compiled from World Bank data)

For exporting firms, the proportion of exports is highest in Algeria. In other words, in Algeria only few firms export, but those that do, tend to export intensively – exporting more than half their sales directly. This hints at the fact that probably all of them are operating in the oil sector. In Oman, one of the countries with the least internationalized firms, the average exporting firm only exports around 4 per cent of sales directly.

The majority of the firms which export, started to do so before three years of age (56 per cent for the sample as a whole). This implies that the ‘born global’ phenomenon has also been affecting the MENA region, although the proportion of all firms that do decide to export is somewhat low in most countries. Table 7 also shows that in countries where more firms export, there are also a larger proportion of inputs being imported. This finding suggests that export products depend on access to appropriate imported inputs and the absence of domestic sources.

Finally there seems to be some suggestion that transport costs and border procedures have some association with the internationalization of firms. For instance, in Morocco where more than half of firms are internationalized, the prevalence of reported failures in transport and the average number of days for exports to clear is the lowest of all the countries in the sample (4 and 2 days respectively). In contrast, in Algeria where only 4 per cent of firms are internationalized it takes

more than four times as long to for exporters to clear customs. In Oman, with only 9 per cent of internationalized firms, more than twice as many days with transport failures are experienced as in Morocco.

6.3 Entrepreneurial Competencies

In the present survey entrepreneurial competencies may be reflected in the origins of the firms, and in the education and experience of its entrepreneur / top manager. Table 8 summarizes the entrepreneurial competencies across the sample.

Table 8: Basic Entrepreneurial Competencies of Firms in the Sample

	MENA	Algeria	Egypt	Morocco	Oman	Syria
Percentage of firms previously state-owned	3.50%	3.90%	4.20%	na	0.60%	na
Highest level of education of entrepreneur/top manager is university degree	19.80%	na	4.90%	24.70%	42.10%	30.10%
Years of experience of entrepreneur/top manager	13 years	na	18 years	9 years	13 years	11 years
Foreign experience of entrepreneur/top manager	2 years	na	0.5 year	2 years	8 years	0.5 year

(Source: Compiled from World Bank data)

Table 8 indicates that most firms originated in the private sector – only about 3.5 per cent originated as a government owned firm. Furthermore, educational achievement of entrepreneurs/top managers ranges from around 19 per cent with a university education, with 13 years of experience in the sector and 2 years of foreign experience. The best educated entrepreneurs, and also those with most foreign experience, are to be found in Oman, with the lowest levels of education and foreign experience in Egypt.

6.4 Technological Innovation and Productivity

The basic innovation and technological profile of the firms in the sample is summarized in Table 9.

Table 9: Basic Innovation and Technological Performance Profile of Firms in the Sample

	MENA	Algeria	Egypt	Morocco	Oman	Syria
Average number of new products introduced by a firm over last three years	2	2	Na	1	6	4
Average R&D spend per firm (LCU)		Na	34.7	45.8	840	332
Average R&D spend per firm (US\$)			5.78	5.09	2210.53	30.18
<i>Percentage of</i>						
Firms in a high-tech sector	7.50%	12%	7.30%	7.10%	3.00%	7.50%
Firms that upgraded an existing product line	36.60%	Na	22.70%	44.80%	45.80%	46.80%
Firms using technology licensed from a foreign-owned company	8.60%	Na	10.10%	5.20%	11.80%	10.80%
Firms with ISO certification	8.70%	Na	8.80%	8.90%	10.80%	8.00%
Firms that introduced new production technology	25.70%	Na	14.50%	na	36%	43%
Firms that outsourced a major production activity that was previously conducted in-house	5.10%	Na	4.10%	6.50%	4%	na
Firms with top manager with university level education	20.10%	Na	4.90%	24.70%	42.10%	30.10%
Own website						

(Source: Compiled from World Bank data)

Table 9 shows that in the sample the level of innovation and technological performance is relatively low. Firms introduced on average only 2 new products over a three-year period, only 7.5 per cent of firms resorted in a high-tech sector (IT services, chemicals and pharmaceuticals, auto and auto-components and telecommunications), and only 8 per cent of firms had ISO accreditation. Table 9 also confirms the macro-picture presented in the previous section in terms of the relative lack of skilled entrepreneurs – only one in five firms on average had a top manager (entrepreneur) a university-level education, and only one in four firms introduced a new technology in production over the past three years. Most innovation seems to take the form of

upgrading existing product lines rather than introducing a new product or outsourcing production activities.

As far as the individual countries are concerned, Table 9 shows that at the firm level Oman is the most innovative and technologically advanced country. Omani firms have launched on average 6 new products over the past three years, and also displayed the highest R&D expenditure in USD terms in the region, and the most educated management/entrepreneurs, the highest percentage of ISO accredited firms. Almost half of its firms upgraded their products in recent years. This is despite the fact that only 3 per cent of Omani firms in the survey can be classified as being in a high-tech sector. However, it is consistent with the macro-view that indicated that Oman is the country in the region with the lowest proportion of high-tech exports (only 0.73% of manufactured exports are high-tech).

The World Bank survey also included questions about different ways in which firms acquired technological innovations. These are ranked in the order of importance. The various options, and their responses for the entire sample and the individual countries are summarized in Table 10. Unfortunately no data is available for Morocco.

Table 10: Ways of Acquiring Technological Innovations in selected MENA countries

Ways of Acquiring Technology	MENA	Algeria	Egypt	Morocco	Oman	Syria
Embodied in new machinery or equipment	61.17%	68.04%	89.22%	Na	35.29%	54.19%
By hiring key personnel	2.36%	0%	1.96%	Na	10.29%	2.23%
Licensing or turnkey operations from international sources	1.39%	1.03%	0.98%	Na	1.47%	1.68%
Licensing or turnkey operations from domestic sources	0.83%	0.52%	0.98%	Na	1.47%	0.84%
Developed or adapted within the establishment locally	9.99%	12.37%	1.96%	Na	22.06%	8.94%
Transferred from parent company	2.36%	3.61%	3.92%	Na	4.41%	0.84%
Developed in cooperation with client firms	1.80%	2.06%	0.98%	Na	4.41%	1.40%
Developed with equipment or machinery supplier	3.47%	3.61%	0%	na	7.35%	3.63%
From a business or industry association	0.97%	2.58%	0%	na	0%	0.56%
Trade Fairs and/or Study Tours	12.62%	4.64%	0%	na	11.76%	20.67%
Consultants	2.77%	1.55%	0%	na	0%	4.75%
From universities, public institutions	0.28%	0%	0%	na	1.47%	0.28%

(Source: Compiled from World Bank data. Notes: Proportions for MENA based on responses of 721 firms from 3281)

Table 10 shows that by far the most important way in which firms in MENA acquire technological innovations is through the technology being embodied in new machinery or equipment. This is in line with the classification as technology users, rather than developers, presented above. Internal innovations, acquired from within the firm locally, are only responsible in 10 per cent of firms as the most important way of obtaining technology. In general, trade and study tours form the second most important method of obtaining technological innovations. Universities, business and industry associations and licensing seem to play a very minor role in MENA in provision of technology to firms. This would suggest the absence of any significant national innovation system.

Table 10 also supports the conclusion made earlier that in this sample Oman is one of the technologically most advanced MENA country in the sample. This corresponds nicely with the classification as a technology consumer. In comparison to the other countries it has much more diverse ways of acquiring technology – only 35 per cent is due to new machinery and equipment, with 22 per cent developed locally (but most likely not by nationals) - substantially more than any of the other countries. In Oman universities and public institutions play a small, but more substantial role than in any other MENA, country and the hiring of key personnel to drive technological innovation is significantly more important here, too. Note that Oman's economy is, as much as in all other small Gulf countries, almost entirely run by foreign workforce. Key positions are however filled with nationals, often part of or close allies of ruling families. This might partially explain, the comparatively small proportion of technology acquired through key personnel. And again just as the other small Gulf states, Oman has not a single home grown university. Only very recently top Ivy-league universities are opening branches in this part of the region. These are mainly attracted by generous funding and 0-tax arrangements. In contrast, universities in Egypt and Syria are home grown universities that were among, if not the best in the world. But this is a long time ago. Oman was until the discovery of oil a non-territorial state with a majority population of non-resident Bedouin tribes, and very little institutions. In contrast, Syria and Egypt host cities that are among the oldest constantly inhabited cities in the world.

In contrast to Oman, we find that firms in Egypt appears to be the least innovative in terms of acquiring new technology – the vast majority (90 per cent) only obtain more recent technologies through new machinery or equipment.

6.5 Regression Results

As mentioned in the methodology section, we consider two types of dependent variables in our regression analyses. These are (i) a firm's decision to export or not, which is measured by a dummy variable which = 1 if the firm has had positive exports and = 0 if not; and (ii) the level of a firm's exports if it does decide to enter the export market. This which is measured by the percentage share of exports in its total sales. We also make a distinction between international new ventures (INVs) and all exporters, by defining a dummy variable = 1 if a firm started exporting before the end of its third year.

In the top part of Table 11 the outcome stage, identifying the determinants of the level of a firm's exports are shown, and in the bottom part the selection stage, identifying the determinants of the decision to export, and to export early, are shown.

The variables, shown in column 1, have been identified, and related to the theoretical determinants of internationalization in Table 1.

Table 11: Heckman two-step regression (dependent variables: decision to export and export share)

Variable	All exporters	INVs (1)	INVs (2)
Outcome model			
Age of firm	-0.06 (-0.33)	0.12 (0.34)	0.14 (0.42)
High-tech product	-11.9 (-1.25)	-9.26 (-0.62)	-7.4 (0.39)
R&D spending	-0.00 (-0.64)	0.00 (0.38)	0.00 (0.43)
New technology used	5.06 (0.67)	-2.37 (-0.21)	-2.79 (-0.23)
Website	16.9 (1.99)*	28.22 (2.70)**	30.14 (2.56)**
Foreign-licensed tech	0.55 (0.07)	-14.8 (-0.88)	-16.18 (-1.14)
Foreign shareholding	-2.37 (-0.22)	2.09 (0.11)	-
University-level education	-1.76 (-0.19)	-8.09 (-0.53)	-9.32 (-0.58)
Foreign experience	-0.69 (-0.80)	-0.47 (-0.44)	-0.31 (-0.27)
Bribes	-0.03 (-0.05)	2.87 (2.06)*	2.87 (1.92)*
Constant	39.7 (2.49)*	12.42 (0.43)	6.11 (0.16)
Selection model			
Age of firm	0.00 (0.28)	-	-
Year established	-	-0.16 (-0.23)	-0.15 (-0.22)
High-tech product	0.02 (0.08)	0.40 (1.11)	0.58 (1.69)*
R&D spending	0.00 (1.03)	0.00 (1.27)	0.00 (1.11)
New technology used	0.52 (2.78)**	-0.21 (-0.69)	-0.25 (-0.84)
Website	0.79 (5.56)***	0.21 (0.87)	0.21 (0.90)
Foreign-licensed tech	-0.15 (-0.75)	-0.56 (-1.56)	-0.27 (-0.85)
ISO accreditation	1.17 (6.27)***	0.07 (0.28)	0.12 (0.49)
Foreign shareholding	-0.00 (-0.04)	0.87 (2.08)*	-
University-level education	0.11 (0.46)	-0.17 (-0.50)	-0.19 (-0.54)
Foreign experience	0.02 (1.31)	-0.01 (-0.42)	0.00 (0.09)
Bribes	-0.00 (-0.94)	-0.01 (-0.76)	-0.02 (-1.09)
Constant	-1.52 (-13.2)***	327 (0.23)***	315.3 (0.22)
No. of obs	780	128	128
Censored obs	665	68	68
Uncensored obs	115	60	60
Wald χ^2	62.16***	28.62**	25.25
ρ	0.007	0.57	0.72

Note: z -ratios in parenthesis. ***, ** and * indicate significance at the 1%, 5% and 10 % levels respectively.

Source: Authors' calculations.

In Table 11, the second column contains the results for all firms. The third column shows the results in the outcome model for firms that internationalized early and where a control is included for foreign shareholding in the firm. Column 4 presents the same results, but without controlling for foreign shareholding.

Table 11's results indicate that as far as the decision to export or not are concerned, that in the case of MENA technological factors are statistically significant determinants. Firms with ISO accreditation, an own website, and who has introduced new technology during the year, have a higher probability of entering export markets than otherwise. In contrast, the entrepreneur/top managers' education, experience, as well as the age of the firm and institutional factors such as bribes, and foreign shareholding does not seem to be significant for the full sample.

Once firms have made the decision to enter export markets, the extent of their exports is poorly explained by the current model. Perhaps more variables are needed than what is available in the current survey. What the results do show however is that firms with a website tend to export a higher percentage of their production than firms without a website. Entrepreneurial education and experience were again not significant.

As far as the speed of internationalization is concerned, the results in Table 11 indicates that firms with foreign shareholding has a significant probability of starting exporting before they are three years of age. But none of the other variables has any significance, and the model general does a poor job predicting early exporters. It would seem that apart from foreign shareholding (which would allow the firm access to information about foreign markets) not much can be said about why firms in the MENA region would internationalize early. To throw further light on this, we estimated the model without controlling for foreign shareholding. The results, in column 4 of Table 11, shows that in such a case, being in a high-tech sector results in a firm having a higher probability of being an early exporter. However with foreign shareholding this advantage of high-tech firms disappears.

The extent of early internationalizing firms' exports is as in the case of all firms not very well explained by the model. It shows that again, firms with a website tend to export more. Interestingly, and different from the case of all firms, it would seem that young firms (early international entrepreneurs) need to pay more bribes if they want to increase the share of their exports. The institutional environment may therefore be a constraint not on the decision of firms to export at a young age, but on the extent of their exports.

Overall, the regression results support our first hypothesis in that it provides evidence that firms in the MENA-region are relatively more constrained in terms of entering export markets by enabling factors such as technology than mediating factors such as entrepreneurial capabilities. As for our second hypothesis, it there is only evidence that technological know-how, as reflected in the technological sophistication of the firm's product, matters for the speed of internationalization, when one does not control for foreign ownership. The implications are that international entrepreneurship in the MENA region can be supported by improving conditions for technological innovation, adoption of new technologies, use of the internet, limiting corruption and bribery, and facilitating foreign investment in domestic firms. Improvements in the institutional environment that would make this possible can thus be recommended.

7 Summary and Concluding Remarks

The empirical study of international entrepreneurship has been neglected in the Middle East and North African (MENA) region. Not much is known about the why, the how and the impact of non-oil producing firm internationalization (particularly exporting) in MENA. It is known however that firm internationalization outside the oil-producing sector is very low. Unlike most of SSA however, the MENA region's geographic proximity to markets in Europe and Asia makes this lack of international entrepreneurship in its economic development harder to understand. In this paper we attempted to provide answers to these questions using a firm-level dataset covering 3,281 firms across five countries: *Algeria, Egypt, Morocco, Oman and Syria*. We focused in particular on the relative importance of entrepreneurial capabilities (measured through entrepreneurial orientation, experience and education) and technological capacities (measured through the extent of innovations and technological advances) for international entrepreneurship in the region.

We found that technology (enabling factor) matters most for international entrepreneurship in the MENA region and that institutions (motivating factor) hamper mostly young firms (early international entrepreneurs). Firms in a high-tech sector have a higher probability of being an early exporter. However if we control for foreign shareholding this advantage of high-tech firms disappear.

In general, technological weaknesses constrain internationalization. In our sample the level of innovation and technological performance is relatively low. Firms introduced on average only two new products over a three-year period, only 7.5 per cent of firms resorted in a high-tech sector (IT services, chemicals and pharmaceuticals, auto and auto-components and telecommunications), and only 8 per cent of firms had ISO accreditation. Only one in four firms introduced a new technology in production over the past three years. Most innovation seems to take the form of upgrading of existing product lines rather than introducing a new product or outsourcing production activities. In line with the technology country groups that we presented, all countries of our sample firms would benefit from technology improvements in order to assure a better use and utilization of available standards – not high-technology.

Firms with ISO accreditation, their own website, as well as those which have introduced new technology during the year display a higher probability of entering export markets than otherwise. Interestingly, and yet in line with regional political economy characteristics outlined in the section above, the entrepreneur/top managers' education or experience has no significant impact on international entrepreneurship

These results support the notion that economic inefficiencies in these countries are rooted deeply in the political economy structures and suggest that other factors such as personal connections and family ties that were not covered by the data are important determinants of successful (international) entrepreneurship. Against this background the finding that the need to pay informal payments does not constrain international entrepreneurship is no longer counter-intuitive. For members of the networks, informal payments fuel business activities and the trade-off between extra cost and little extra cost might still, in the majority of cases, be positive overall. And yet, these results are alarming. Our results suggest that young international entrepreneurs appear to need to make more informal payments to officials than their more established competitors, in order to export more. The implications are that international entrepreneurship in the MENA region can be supported by improving conditions for technological innovation, adoption of new technologies, use of the internet, limiting corruption and bribery, and facilitating foreign investment in domestic firms. Improvements in the institutional environment that would make this possible can thus be recommended.

References

- Abu-Qarn, A. S. and S. Abu-Bader (2007): Sources of Growth revisited: Evidence from Selected MENA Countries, in: *World Development*, Vol. 35, No. 5, pp. 752-771.
- Al-Marhubi, Fahim. 2000. Export Diversification and Growth: An Empirical Investigation. In: *Applied Economics Letters*, 7: 559-62.
- Autio, E., Sapienza, H.J. and Almeida, J.G. 2000. Effects of Age at Entry, Knowledge Intensity, and Imitability on International Growth, in: *Academy of Management Journal*, 43: 909-924.
- Bisat, A., M. El-Erian, and T. Helbling (1997): Growth, Investment, and Saving in the Arab Economies, in: *IMF Working Papers*, No. 85.
- Brach, Juliane. 2007. Euro-Mediterranean Partnership: The Role and Impact of the Economic and Financial Dimension. In: *European Foreign Affairs Review*, 12(4): 555-579.
- Brach, Juliane. 2008. Economic Development in the Arab Countries of the Middle East and North Africa - Determinants, Constraints, and Implications for EU-Arab Relation. Hamburg: Hamburg University Press.
- Brach, Juliane. 2009. Technology, Political Economy, and Economic Development in the Middle East and North Africa. In: *Review of Middle East Economics and Finance*, 5(3): 1-23.
- Brach, Juliane and Robert Kappel. 2009. Global Value Chains, Technology Transfer and Local Firm Upgrading in Non-OECD Countries. GIGA Working Paper Series, 110.
- Brach, Juliane (2010) "Technological Readiness in the Middle East and North Africa – Implications for Egypt", GIGA Working Paper, No. 155.
- Castellacci, Fulvio and Natera, Jose Miguel, 2011. "[A new panel dataset for cross-country analyses of national systems, growth and development \(CANA\)](#)," *MPRA Paper* 28376, University Library of Munich, Germany. De Ferranti, D., Perry, G.E., Lederman, D., and W.F. Maloney. 2002. From Natural Resources to the Knowledge Economy. The World Bank, Washington, D.C.
- Foster, Neil. 2006. Exports, growth and threshold effects in Africa. In: *Journal of Development Studies*, 42(6): 1056-1074.
- Funke, Michael, and Ralf Ruhwedel. 2005. Export Variety and Economic Growth in East European Transition Economies. In: *Economics of Transition*, 13(1): 25-50.

- Hausmann, Ricardo, Hwang, Jason and Dani Rodrik. 2007. What you export matters. In: *Journal of Economic Growth*, 12(1):1-25.
- Herzer, Dierk and Felicitas Nowak-Lehmann D. 2006. What does export diversification do for growth? An econometric analysis. In: *Applied economics*, 38(15): 1825-1838.
- Johanson, Jan, and Jan-Erik Vahlne. 1977. The Internationalization Process of the Firm: A Model of Knowledge Development and Increasing Foreign Market Commitment. In: *Journal of International Business Studies*, 4: 20-9.
- Matthee, Marianne and Wim Naudé. 2008. The Determinants of Regional Manufactured Exports from a Developing Country. In: *International Regional Science Review*, 31(4): 343-358.
- Mengistae, Taye and Catherine A. Pattillo. 2004. Export Orientation and Productivity in Sub-Saharan Africa. In: *IMF Staff Papers*, 51(2):327–353.
- Nabli, Mustapha Kamel. 2007. *Breaking the Barriers to Higher Economic Growth - Better Governance and Deeper Reforms in the Middle East and North Africa*. Washington D.C.: World Bank.
- Naudé, W.A., Oostendorp, R. and P.A.E. Serumaga-Zake. 2002. South African Manufacturing in an African Context: Findings from Firm-Level Surveys. In: *South African Journal of Economics*, 70(7): 1247-1272.
- Naudé, W.A. and P.A.E. Serumaga-Zake. 2003. Firm Size, Efficiency and Exports: Empirical Evidence from South Africa. In: *Journal of Small Business and Entrepreneurship*, 16(3/4): 67-80.
- Naudé, Wim. 2009. Rushing in Where Angles Fear to Thread? The Early Internationalization of Indigenous Chinese Firms. In: *Journal of Chinese Economic and Foreign Trade Studies*, 2(3): 163-177.
- Naudé, Wim and Stephanie Rossouw. 2010. Early International Entrepreneurship in China: Extent and Determinants. In: *Journal of International Entrepreneurship*, 8(1): 87-111.
- OECD. 2009. *Responding to the Economic Crisis: Fostering Industrial Restructuring and Renewal*. Paris: OECD.
- Oviatt, B. M., and P. McDougall. 2005. Defining International Entrepreneurship and Modelling the Speed of Internationalization. In: *Entrepreneurship Theory and Practice*, September: 537-53.
- Rankin, Neil, Söderbom, Måns and Francis Teal. 2006. Exporting from Manufacturing Firms in Sub-Saharan Africa. In: *Journal of African Economies*, 15(4): 671-687.

- Sekkat, Khalid. 2009. Economic Policies, Firms Entry and Exit and Economic Performance in four MENA countries. Femise Research Programme 2007-2008.
- Söderbom, Måns, Teal, Francis and Alan Harding. 2006. The Determinants of Survival among African Manufacturing Firms. In: Economic Development and Cultural Change, 54 (3): 533-555.
- Soete, Luc. 2008. Science Technology and Development: Emerging Concepts and Visions. UNU-MERIT Research Paper, 001.
- Van Biesebroeck, Johannes. 2005a. Exporting Raises Productivity in Sub-Saharan African Manufacturing Firms. In: Journal of International Economics, 67(2) : 373-391.
- Van Biesebroeck, Johannes. 2005b. Firm Size Matters: Growth and Productivity Growth in African Manufacturing. In: Economic Development and Cultural Change, 53(3): 545-83.
- Westhead, P., Wright, M., Ucbasaran, D., 2001. The Internationalization of New and Small Firms: a Resource-Based View, in: Journal of Business Venturing, 16(4): 333-358.
- World Bank. 2010. Innovation Policy - A Guide for Developing Countries. Washington, D.C.
- Zhou, Lianxi. 2007. The Effects of Entrepreneurial Proclivity and Foreign Market Knowledge on Early Internationalization. In: Journal of World Business, 42(3): 281-93.

Appendix: Summary of variables

Table A1: Summary Statistics

Variable	Number of obs	Mean	Standard deviation
Age of firm	2417	18 years	14 years
High-tech product	3281	7.4%	26%
R&D spending	1770	89	711
New technology used	2486	25%	43%
Website	3186	25%	44%
Foreign-licensed tech	2450	8.7%	28%
Foreign shareholding	3281	8%	27%
University-level education	2419	19.8%	39.8%
Foreign experience	2156	1.6 years	4.5 years
Bribes	1341	2.73	8.6
ISO	2461	8.7%	28.2% ⁹

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