

ERF Policy Brief

Which Firms Are More Digitized in Egypt and Jordan?

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About the authors

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In a nutshell

- Using a new dataset collected by the Economic Research Forum, this policy brief examines the characteristics of the firms who adopt digital technologies by focusing on Egypt and Jordan.
- The main findings show that firms having an owner whose education level is university and above and who is a woman are more likely to be digitized, especially in Egypt. Moreover, firms that spend on R& D and operating in the services sector adopt and use different digital platforms.
- Small and medium firms are generally facing several impediments and are not as digitized as large ones. Numerous bottlenecks hinder digitalization in these countries namely the legal and human infrastructure as well as the general quality of institutions including service restrictions.

Firms' Digitalization in Egypt and Jordan

Digitalization refers to the transition from an industrial age characterized by analogue technologies to a new era in which commerce, innovation, knowledge acquisition, communication and many other aspects of modern life are driven by digital technologies (Acemoglu, and Restrepo, 2019). The introduction of digital technologies is considered disruptive to business in the sense that new technologies are rapidly reshaping business models and introducing different ways for businesses to connect with their customers and to deliver their products and services. This becomes even more important in the post pandemic era where firms have to make use of e-commerce, social media platforms, and websites in order to expand (Škare and Sorinao, 2021).

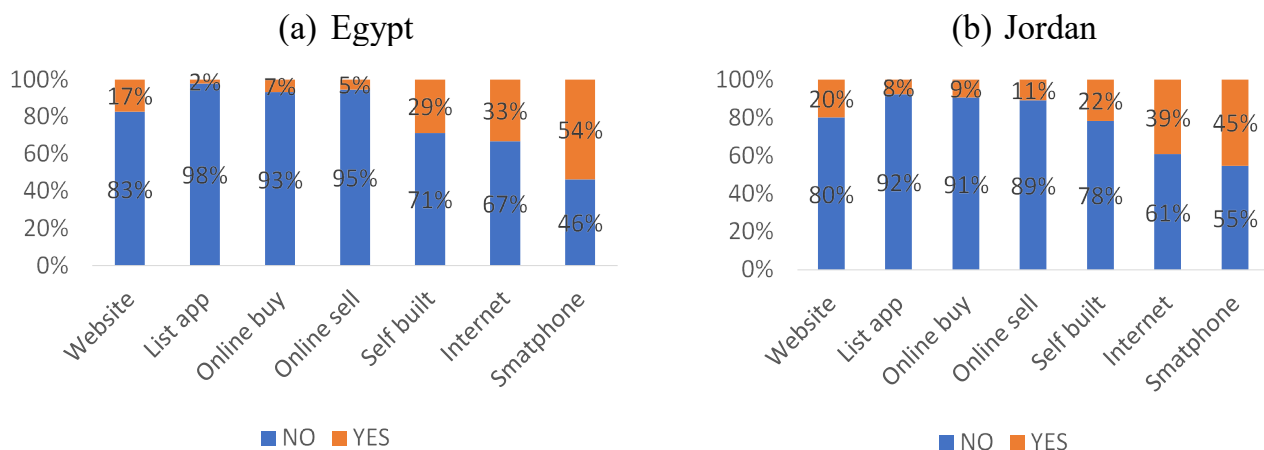
This policy brief focuses on two countries in the Middle East and North Africa (MENA) region, namely Egypt and Jordan. The latter, despite being diversified compared to other MENA countries, are in dire need to increase exports and boost small and medium firms that are still excluded from the digital transformation process. In fact, most of the firms do not adopt digital tools as it is shown in Figure 1. Yet, Jordan is performing slightly better than Egypt in all measures except for the use of smartphones in business and the use of self-built websites for payments. Thus, several reforms are needed to let firms in these two countries benefit from digital transformation, which can transform the lives and livelihoods of their populations.

Several reasons can explain such a performance. First, despite the improvement of infrastructure in these countries, they have a lower logistics performance when compared to similar emerging markets such as

Turkey, Chile, and China. This shows to what extent the quality of infrastructure needs to improve in order to be ready to accommodate the digital infrastructure. More particularly, electricity is a fundamental determinant of digitalization to guarantee Internet access and stable connection. Yet, while the time to obtain an electricity connection in Jordan is significantly low (around 4 days), it reaches 77 days in Egypt. In addition, based on the World Bank Enterprise Survey, Egyptian firms report more electrical outages than Jordanian ones (28% and 13% respectively). Table 1 compares three obstacles: power outage measured the number of power outage in (last month) 2022, the number of days with no internet access (interruption) in last month and the number of days with no online services (interruption) in last month. Problems are less frequent in Jordan than in Egypt as the number of outage, the number of days without internet and without online services are lower. In addition, when different tools are compared, it is important to note that more advanced tools are generally associated to more barriers (whether power outages or the number of days without internet or online services). This applies to firms that have a website, listed application, and self-built website (Zaki, 2023a).

At the institutional level, while most of the emerging markets have recently adopted different laws pertaining to e-commerce such as -transactions laws, consumer protection laws, privacy laws cybercrime laws, there are still several challenges in terms of enforcement and implementation. Both Egypt and Jordan have a legislation in four and three areas respectively, which is relatively high compared to other countries. Yet, enforcement, impartiality, and effectiveness are still challenged because of the relatively poor quality of institutions. Better institutions help define a framework

Figure 1: Share of Firms Adopting a Digital Tool (%)



Source: Author's own elaboration using the Firm Digitalization dataset (2022).
Notes: Weights are used.



Table 1: Obstacles Faced by Firms

	Egypt					
	Power outage		No. days w/o internet		No. days w/o online ser.	
	No	Yes	No	Yes	No	Yes
Website	2.14	3.81	0.54	1.12	7.91	6.52
List app.	2.24	9.87	0.93	0.32	7.85	1.21
Online buy	5.02	2.50	0.83	0.88	3.07	8.34
Online sell	2.20	3.62	1.60	0.41	10.87	4.80
Self-built	3.82	3.13	0.42	0.39	5.58	2.89
Internet		2.21		1.39		6.40
Smartphone	1.88	3.31	3.34	0.39	7.15	7.12
	Jordan					
	Power outage		No. days w/o internet		No. days w/o online ser.	
	No	Yes	No	Yes	No	Yes
Website	0.48	0.64	0.70	0.71	0.24	0.38
List app.	0.57	0.53	0.63	0.95	0.34	0.21
Online buy	0.65	0.50	0.77	0.66	0.40	0.25
Online sell	0.61	0.54	0.62	0.74	0.28	0.33
Self-built	0.43	0.92	0.59	1.28	0.23	0.66
Internet	0.44	0.50	0.07	0.66	0.92	0.28
Smartphone	0.64	0.52	0.80	0.65	0.27	0.34

Source: Author's own elaboration using the Firm Digitalization dataset (2022).

Notes: (i) Weights are used. (ii) Power outage is measured the number of power outage in (last month) 2022. No. days w/o internet is measured by the number of days with no internet access (interruption) in last month. No. days w/o online ser. is measured by the number of days with no online services (interruption) in last month.

for market transactions, establish accountability for the stakeholders (e.g. by increasing the traceability of agents and actions), and enable enforcement.

Another potential explanatory factor is education and human capital given that digitalization requires a highly skilled labor. Yet, both of the two countries are still lacking the relevant skills, especially for blue collars (Aboushady and Zaki, 2021).

Finally, digitalization is highly intensive in services. Yet, most of the services are more protected in the MENA region compared to other regions. This, consequently, make services less competitive and might affect the adoption of digital tools (Karam and Zaki, 2013 and 2022). This is even more important for the manufacturing sector that relies heavily on services including ICTs.

Methodology and Main Findings

This policy brief relies on a newly collected dataset by the Economic Research Forum (ERF - Cairo, Egypt) in the framework of the Open the Open Access Micro Data Initiative (OAMDI) for the Arab countries, Iran and Turkey. The questionnaire includes several modules as follows: basic information on the firm (sector of operation size, owner's gender and education, and types of owners). Second, it includes another module on digitalization (whether the firm has a website or not, uses smartphones or not, online selling and buying, the Internet, is listed on an application and self-built sales website that enables online payment). Third, it describes the characteristics labor used (women, digital skills, etc.). Finally, a module analyzes the main challenges faced by firms when it comes to digitalization such as electricity outage, days without Internet connection, and cost of digitalization). This survey has been done for three countries (Egypt, Jordan, and Morocco) over two waves for around 1000 observation per country.

To examine the determinants of the adoption of different digital variables, a probit model (Zaki, 2023b) has been used where the dependent variable measures the different digital variables, namely whether the firm has a website or not, uses smartphones or not, online selling and buying, the Internet, is listed on an application and self-built sales website that enables online payment. The independent variables include the size of the firm by taking the natural logarithm of employment, whether the owner has a university degree or above, whether the owner is a female or not, whether the firm is exporting or not, the age of the firm and whether the firm is spending on R&D or not.

The main findings show that in Egypt, the larger the firm, the higher the likelihood of adopting and using different digital tools. This result holds for all the dimensions except smartphones and the overall index. In Jordan, all the dimensions are positively affected by the size of the firm. In terms of human capital, the education of the owner matters for firms in Jordan more than Egypt. These results are confirmed by Olurinola et al. (2021) who find that size of the firm, educational attainment of the top manager of the firm, employment, and sector of operation are key determinants of digitalization. In addition, Gutiérrez, and Gamboa (2010) show that the most important factor affecting the digitalization of low-income people in Colombia, Mexico, and Peru was lack of education. Gender matters to a certain extent in Egypt for whether the firm is listed on an application or not pointing out the digital divide that can be observed for this variable. Yet, this variable is insignificant in the



Jordanian case. Exporting status is positively associated to the overall index of digitalization, the use of self-built websites, and the use of the Internet in Egypt but insignificant for Jordan. Moreover, age does not seem to exert a significant effect neither in Egypt nor in Jordan. Being located in Amman matters for Jordanian firms pointing out the importance of investing in digital infrastructure in other regions. In Egypt, it is obvious that firms that are located in Upper Egypt face more difficulties when it comes to the adoption and use of digital tools given the lack on investments. Among the most significant variables, research and development exerts a statistically significant effect in both Jordan and Egypt for the measures of digitalization.

Increasing and Deepening Digitalization in the MENA Region

In a nutshell, the most important determinants of adopting a digitalization measure are the owner's education level, firm size and R&D spending. Gender matters but to a lesser extent. In addition, digitalization in these countries is hindered by the legal and human infrastructure as well as the general quality of institutions including service restrictions. Against this background, this brief suggests a number of policy recommendations that have to be taken into account.

First, more efforts are needed in order to make small and medium firms better digitized (UNCTAD, 2019) given that larger firms are more likely to adopt more sophisticated digital tools. A larger (and more available) access to finance can help SMEs to bear the fixed cost required to adopt new digital tools.

Second, more policies are needed to improve the quality of labor and human capital, as digitalization requires skilled labor, especially blue collar workers who primarily work in the manufacturing sector. Indeed, while the service sector is performing relatively well, government policies need to focus on the digitalization of the manufacturing sector. This is of particular importance given the servicification of the manufacturing sector where the latter increasingly depends on services (Karam and Zaki, 2020).

For a development perspective, inclusion of remote areas should be a priority in order to increase the use of digitalization measures. Our results show that digitalization remains a characteristic of the core (main cities), whereas the periphery is left behind. Thus, during the last decades, digitalization exacerbated rural-

urban disparities, while it should have reduced them. To overcome such a divide, investments in the digital infrastructure are needed in remote areas to make the benefits of digitalization more equitable, available, and inclusive.

Finally, improving the quality of institutions is key in order to improve the digitalization of firms in the MENA region given that most of the digital measures are highly sensitive to the quality of institutions (including the enforcement of related laws). This also includes service restrictions that hinder the competitiveness of the ICT sector. Hence, further efforts towards service liberalization are necessary to increase the competitiveness of local service sectors, and therefore help attract foreign firms in the MENA region and increase technological spillovers.

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ERF at a Glance: *The Economic Research Forum (ERF) is a regional network dedicated to promoting high-quality economic research for sustainable development in the Arab countries, Iran and Turkey. Established in 1993, ERF's core objectives are to build a strong research capacity in the region; to encourage the production of independent, high-quality research; and to disseminate research output to a wide and diverse audience. To achieve these objectives, ERF's portfolio of activities includes managing carefully selected regional research initiatives; providing training and mentoring to junior researchers; and disseminating the research findings through seminars, conferences and a variety of publications. The network is headquartered in Egypt but its affiliates come primarily from different countries in the region.*

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