On Women Participation and Empowerment in International Trade: Impact on Trade Margins in the MENA Region

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ON WOMEN PARTICIPATION AND EMPOWERMENT IN INTERNATIONAL TRADE: IMPACT ON TRADE MARGINS IN THE MENA REGION[1]

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Abstract

This paper investigates the contribution of female labor participation as well female ownership/management to trade margins using firm-level data for 18 manufacturing and services sectors in 8 MENA countries for 2013. This topic is innovative, and critical for the MENA region where female participation in the export sector is shy, at a time the region is looking for new sources of competitiveness to boost its exports. Our results show that first, female labor participation has a positive a significant impact on both the probability of export and export volume, with the effect on the probability of the firm to export being lower for small firms relatively to large firms. Female labor participation matters in traditional sectors where the MENA region has a comparative advantage. Second, while female ownership or management is not significant in its impact on trade margins, it seems to be positively correlated with the probability of large firms to export. Furthermore, this positive effect is mainly driven by female ownership and not management, highlighting the importance of female empowerment in international trade. Third, there is no statistical evidence that female-owned/managed firms face more financial constraints to export than their male counterparts. The effect of other regulatory barriers on exports, such as having a website for the company, is more pronounced for female-owned/managed firm, with respect to a men-owned/managed firm.

1. Introduction

Women play a major role in the global economy. Sen (1999) points out that "the empowerment of women is one of the central issues in the process of development for many countries in the world today", highlighting the role of women's education, their ownership pattern, their employment opportunities, the nature of the employment arrangements, and the attitude of the society towards women's economic activities in this process. The progress in gender equality is encouraging, but far from finished. In one of the dimensions of unachieved gender equality, one can highlight the relatively low participation of women in trade, as employees, producers and owners (International Trade Center (ITC), 2015). Female participation in trade can provide an additional boost to the growth potential of openness. Increased female income that arises from international trade is likely to be disproportionally spent on the well-being and education of children, and therefore contributes to lower income inequality and future growth. In addition to the benefit from higher wages, the engagement of women in international trade leads to greater negotiating power within households and communities, improved social status, self-confidence and awareness of rights. Therefore, it is important that women be able to reap the benefits that arise from international trade.

This paper investigates the contribution of female labor participation as well female ownership/management to the extensive margin (the probability of trade) and intensive margin (volume of trade) in the MENA region. This topic is timely and critical for the MENA region where female labor participation in international trade is weak, not to mention female entrepreneurship. Indeed, more than half of MENA exporting firms have a female participation rate lower than 20%, and only 21% of exporting firms are owned or managed by women (ITC, 2015). At the same time, afflicted by conflicts, political and economic instability, the region is looking for new sources of competitiveness to stimulate exports and economic growth. The latter must rely on human resources rather than on natural resources relied on in the past. Women remain a huge, untapped reservoir of human potential for countries in the region (Nabli and Nedereh, 2004). A potential source of unexploited growth resides in the participation of the region's female workforce in international trade. For instance, evidence shows that in the United States, women-owned exporting businesses are on average more than 3.5 times more productive than women-owned businesses that do not export, and that women-owned exporting firms are also about 1.2 times more productive on average than their male counterparts (ITC, 2015).

The bulk of the trade and gender literature investigates whether international trade improves labor market conditions and outcomes for women (Berik et al., 2018; Black and Brainerd, 2004; Boler et al., 2015; Ederington et al., 2009; Juhn et al., 2014; Klein et al., 2013). Apart from the impact of trade on women earnings and gender equality, there is no theoretical or empirical paper, to our knowledge, that tackles the opposite dimension of the subject, namely the role of women in export competitiveness. Evidence is limited to common knowledge and experiences of countries disclosed in reports of international organizations like the United Nations and the Asian Development Bank. For instance, the experiences of the newly industrialized economies have demonstrated the beneficial impact on growth and development of export-oriented strategies. Their success has depended on many factors such as the right policy environment and access to international markets, but equally important was the role of women whose participation was considerable in those export-oriented industries. Economists highlight that industrialization in these countries is as much female-led as it is export-led (United Nations, 2004). Women's

involvement was most visible in the textiles and electronics industries in East Asia and has been one of the factors leading to the success of the Asian Tigers. In the People's Republic of China, women employment in export-oriented manufacturing increased by 2.3 million over just 4 years after accession to the World Trade Organization. In Bangladesh, job creation in the export-oriented garment industry created 4 million jobs, more than 75% for women who were mostly from poor families and entering the labor market for the first time (Asian Development Bank, 2019). Others reports have highlighted some key facts about entrepreneurship from the analysis of firm-level data in developing countries: first, only one in five exporting firms is led by women entrepreneurs. Second, women own and manage companies in different export sectors than their male counterparts, with women entrepreneurship being pronounced in textiles and clothing, and in the computer, telecommunications and consumer electronics sector. Third, women tend to own smaller firms in terms of number of employees than men. Small companies often lack the resources to compete on international markets. Fourth, financial, legal and regulatory barriers (limited access to key inputs such land, finance and market information) as well as cultural barriers impede women entrepreneurs from entering global value chains and upgrading into higher-value activities (ITC, 2015). The following key facts have also been highlighted about female labor participation from the analysis of firm-level data: first, large exporting firms employ a higher share of women than smaller firms. Second, women work in different export sectors than men. Export sectors traditionally associated with women's activities are yarn, fabrics and textiles, clothing and leather, and leather products. By contrast, women are least represented in the workforce of exporting firms active in the transport equipment, non-electric machinery and metal, and other basic manufacturing sectors (ITC, 2015). Firm-level evidence also suggests that women's participation as owners and employees in exporting firms is higher than firms that do not export. In addition, foreign-owned firms tend to employ more women than local firms (Asian Development Bank, 2019).

Inspired from the story that the data tells, this paper investigates the effect of women participation and empowerment on the probability of exports for firms (extensive margin of trade) and the export volume of firms (intensive margin of trade) in the MENA region. In spite of the investment in female education, female economic participation is low due to interrelated socioeconomic, cultural, individual, structural and institutional factors. In most MENA countries, women work and entrepreneurship cluster in a narrow number of sectors considered to be culturally appropriate. Women entrepreneurs are fewer than male entrepreneurs, and tend to be operating younger businesses, usually in consumer-related industries or personal services (ITC, 2015). To our knowledge, this paper is a first attempt to tackle the issue of women's contribution to trade in general, and to exports in particular. Since women participate in trade as employees or entrepreneurs of exporting firms, we have recourse to firm level data and get inspired from the seminal work of Melitz (2003) and its extensions. Melitz highlights the importance of firm heterogeneity in terms of productivity and a fixed cost of entering export markets in determining the number and the type of firms that become exporters as well as the gains from trade. Extensions of the Melitz's (2003) model explicitly account for the decision to export - the extensive margin of trade (Chaney, 2008; Helpman et al., 2008; Melitz and Ottaviano, 2008). We use the World Bank's Enterprise Surveys Database that gathers information on private firms operating in 18 manufacturing and services sectors for 8 MENA countries (Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, Yemen) in 2013. Our control variables include a vector of plant-characteristics that may impact exports, such as labor productivity, the age and the size of

the firm, government ownership, foreign ownership and the presence of a foreign certification, as well as dummies to control for country, location and sector characteristics. We tackle the endogeneity problem of labor productivity raised in the literature by using a set of instruments that are exogenous to trade. Moreover, since export volume is only observed for exporters, we run a Heckman selection model where the selection variable is labor productivity that is seen as a fixed export entry cost. The explanatory variable of our interest is the gender variable that is tackled in different dimensions: the number of female full-time workers in the firm, and whether the firm is owned or managed by a female or not. Then, to capture the concept of empowerment through entrepreneurship, we distinguish between female ownership and female management. We then investigate whether the impact of female participation and empowerment on international trade differs according to firm size. In another step, we run the regressions by service and manufacturing sectors to investigate what sectors are affected by female labor participation. Finally, we account for the different types of barriers faced by female owners/managers. We add a barrier variable to the regression and interact it with female boss. The barrier variable reflects different types of financial and regulatory constraints faced by the firm.

Our results show that first, female workers have a positive a significant impact on both the probability of export and export volume, and that the effect on the probability of the firm to export is lower for small and medium firms relatively to large firms. Female labor participation matters in traditional sectors where the MENA region has a comparative advantage. Second, while the effect of female ownership or management is not significant on trade margins, female management/ownership seems to be positively correlated with the probability of large firms to export. This positive effect is mainly driven by female ownership and not management, highlighting the potential importance of female empowerment in international trade. Third, there is no statistical evidence that female-owned/managed firms face more financial constraints to export than their male counterparts. The effect of other regulatory barriers on exports, such as having a website for the company, is more pronounced for female-owned/managed firm, with respect to a men-owned/managed firm.

The paper is organized as follows. Section 2 depicts the female labor participation and female ownership/management in MENA exporting firms. Section 3 describes the methodology and the data. Section 4 is devoted to the discussion of the results and Section 5 concludes.

2. Stylized Facts

There is a widespread consensus that women's participation in international trade is limited, although supporting evidence is scarce, highlighting cultural, regulatory, and time barriers that make it difficult for women to effectively engage in the labor force or run a business.

The ITC (2015) report shows that women participation in exporting firms varies across regions, with Asia exhibiting the highest share of female employees and West Africa the lowest. Indeed, 35% of exporting firms in Asia employ at least 50% females – and therefore employ more men than women, followed by 31% of exporting firms in Latin America and the Caribbean. Women's employment is the lowest in exporting firms of West African countries where only 11% of firms employ more than 50% females while for 75% of firms, women represent less than 20%

of the workforce. The MENA region stands before West Africa with only 24% of MENA firms having a share of female workers exceeding 50%, while women participation in the workforce is less than 20% for more than half of MENA firms (Figure 10).

Figure 1: Female participation rate in exporting firms' total workforce, by region
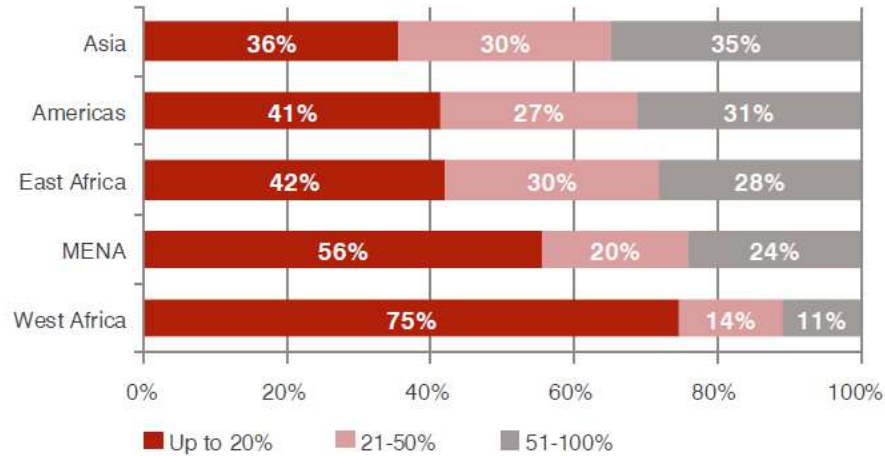
Source: International Trade Center (2015) Non-Tariff Measures Surveys in 20 developing countries, 2010 to 2014. Available at: www.ntmsurvey.org

The aggregate figures for the MENA region hide some heterogeneity among selected MENA countries. Figure 2 shows that Jordan, Egypt, Yemen and West Bank and Gaza are below the region's average women participation rate in the export sector, while Tunisia has the highest female participation rate in the region.

Figure 2: Average female participation rate in the MENA region
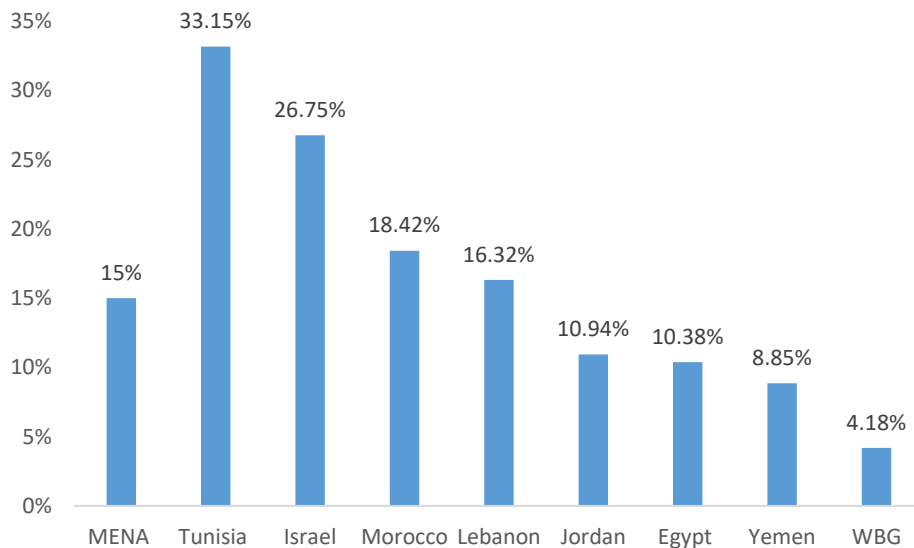
Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

Those figures are supported by Table 1 that highlights the very low participation rate of female employees in the export sector. Indeed, 0% of Yemeni firms employ more than 50% females, while 86.11% employ less than 20% female workers. In West Bank and Gaza, less than 1% of firms have a female participation rate exceeding 50% and 94% of firms employ less than 20% females. In Egypt and Jordan, respectively 2.87% and 3.83% of firms have a female participation rate exceeding 50% while 84% and 83% of firms have a female participation rate smaller than 20%. By contrast, more than 26% of Tunisian firms employ more women and men, and less than 50% of Tunisian firms employ less than 20% females. This figure is appealing because the female participation rate is less than 20% in more than 70% of the exporting firms in our sample. Israel stands generally well after Tunisia, where the female participation rate is less than 20% in 47.22% of the firms only, and between 21 and 50% in 42.36% of the exporting firms.

Table 1: Female participation rate in MENA exporting firms' workforce, by country

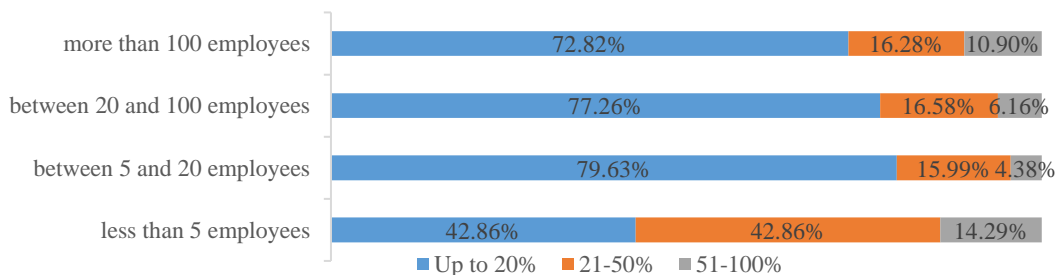|	Up to 20%	21-50%	51-100%
Egypt	84.10%	13.03%	2.87%
Israel	47.22%	42.36%	10.42%
Jordan	82.98%	13.19%	3.83%
Lebanon	73.17%	21.54%	5.28%
Morocco	70%	18.18%	11.82%
Tunisia	49.33%	24.33%	26.33%
West Bank and Gaza	93.76%	5.31%	0.92%
Yemen	86.11%	13.89%	

Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

Surprisingly, when we disentangle women participation according to the size of the firm, our sample show that the average female labor participation rate is the highest for firms with less than 5 employees (47%), followed by firms with more than 100 employees (around 18%), then firms that employ between 20 and 100 employees (14.5%), and finally those that employ between 5 and 20 employees (around 11%). Figure 3 displays the female participation rate according to the size of the firm. Contrary to the documented evidence that large exporting companies employ a larger share of female workers than small exporting companies (ITC, 2015), Figure 3 shows that in the MENA region, men outnumber women in 85% of *small* companies and in almost 90% of large companies with more than 100 employees. The positive relation between firm size and women participation holds if we exclude companies with less than 5 employees. As shown in Figure 3, the share of women participation exceeds 50% in only 4.38% of firms employing 5 to 20 workers, 6.16% of firms employing between 20 and 100 workers, and 10.9% of firms with more than 100 workers.

Figure 3: Women participation rate in exporting firms, by firm size

more than 100 employees	72.82%	16.28%	10.90%
between 20 and 100 employees	77.26%	16.58%	6.16%
between 5 and 20 employees	79.63%	15.99%	4.38%
less than 5 employees	42.86%	42.86%	14.29%

■ Up to 20% ■ 21-50% ■ 51-100%

Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

At the sectoral level, women in the region are most likely to work in exporting firms of sectors like garments, telecom and food, although their participation rate doesn't exceed 30% for garments, 25% for telecom and 18% for food. Those are sectors in which the MENA region has a comparative advantage. Women are least represented in the workforce of exporting firms active in the wood, non-metallic products, metals and leather (Figure 4).

Figure 4: Average women participation rate in exporting firms, by sector

Sector	Rate
Garments	30.39%
Telecom	24.67%
Food	18.33%
Transport	17.77%
Textiles	12.86%
Other manufacturing	12.71%
Construction	12.62%
Other services	12.17%
Publishing printing and recorded media	11.94%
Machinery and equipment	10.84%
Hotels and restaurants	9.64%
Furniture	9.29%
Chemicals	9.13%
Plastics & rubber	6.84%
Metals and Metal Products	5.65%
Leather	4.78%
Non metallic mineral products	4.29%
Wood	3.94%
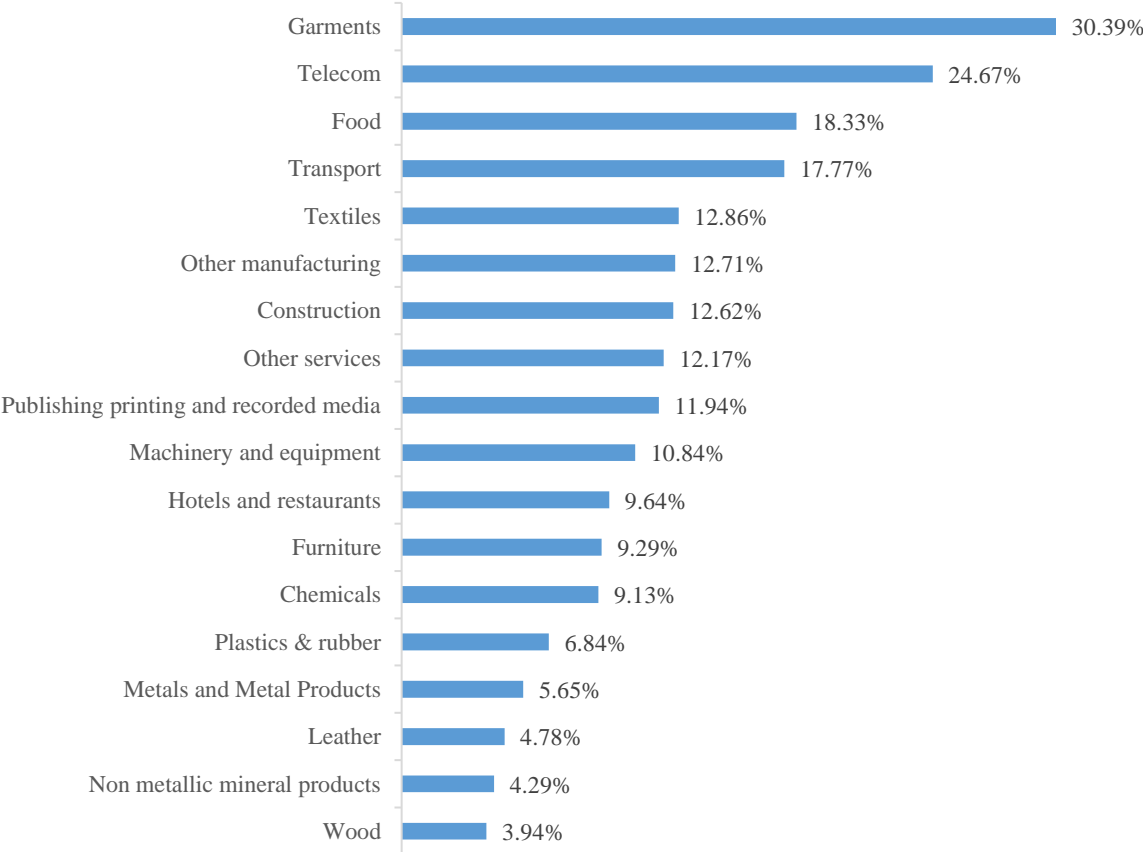
Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

In all sectors, men outnumber women in the workforce of the majority of exporting firms. Figure 5 shows that most firms have a very low representation of women in the workforce (below 20%). In particular, over 90% of exporting firms active in wood, metals, leather, non-metallic products, and plastics, have less than 20% of female employees. On the other hand, in 28% of exporting firms active in garments and 11% of food exporting firms, women outnumber men in the workforce.

Figure 5: Women participation rate in exporting firms, by sector

	Up to 20%	21-50%	51-100%
Wood	95.24%		4.76%
Metals and Metal Products	95.12%	3.66%	1.22%
Leather	93.75%	6.25%	
Non metallic mineral products	92.86%	7.14%	
Plastics & rubber	90.77%	7.69%	1.54%
Machinery and equipment	85.71%	9.52%	4.76%
Textiles	85.23%	9.09%	5.68%
Publishing printing and…	84.21%	12.28%	3.51%
Hotels and restaurants	82.72%	17.28%	
Furniture	82.61%	15.22%	2.17%
Chemicals	82.43%	16.22%	1.35%
Other manufacturing	81.21%	14.18%	4.61%
Other services	78.54%	18.16%	3.30%
Construction	71.88%	21.88%	6.25%
Food	71.43%	17.58%	10.99%
Transport	65.28%	26.39%	8.33%
Garments	56.36%	15.25%	28.39%
Telecom	42.86%	54.55%	2.60%

Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

In the MENA region, on average 21% of firms are owned and/or managed by women, which is a low percentage, although it is higher than West Africa (14%) and Asia (16%). Women's entrepreneurship is the highest in the Caribbean and Latin American countries (27%), followed by East Africa (24%) (ITC, 2015).

At the country level, our sample of 7 MENA countries shows that only Yemen, Jordan and West Bank and Gaza are below the region's average. Tunisia is an interesting case where 54.39% of the firms are managed or owned by women. The share of women's entrepreneurship is also relatively higher than the region's average for Lebanon (38.68%) and Morocco (36.36%).

Table 2: Share of female-owned/managed firms, by country

	Women-Owned	Women-Managed	Women-Owned/Managed
Egypt	21.68%	5.49%	23.75%
Israel	28.57%	6.83%	30.23%
Jordan	16.58%	1.75%	16.58%
Lebanon	31.61%	4.63%	38.68%
Morocco	34.89%	5.16%	36.36%
Tunisia	54.04%	7.77%	54.39%
WBG	13.13%	2.30%	13.59%
Yemen	11.04%	0.67%	11.37%

Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

The picture looks brighter for the majority of countries when we look at the share of women-owned/managed firms engaged in the export sector. In particular, the share of Yemen and Jordan is now increased to 22% and 23% respectively, but are still below the region's average of 31.21%. Also, the share of women entrepreneurship increases to 43% and 44% for Morocco and Lebanon when we account for exporting firms (Figure 6).

Figure 6: Share of female-owned/managed exporting firms, by country
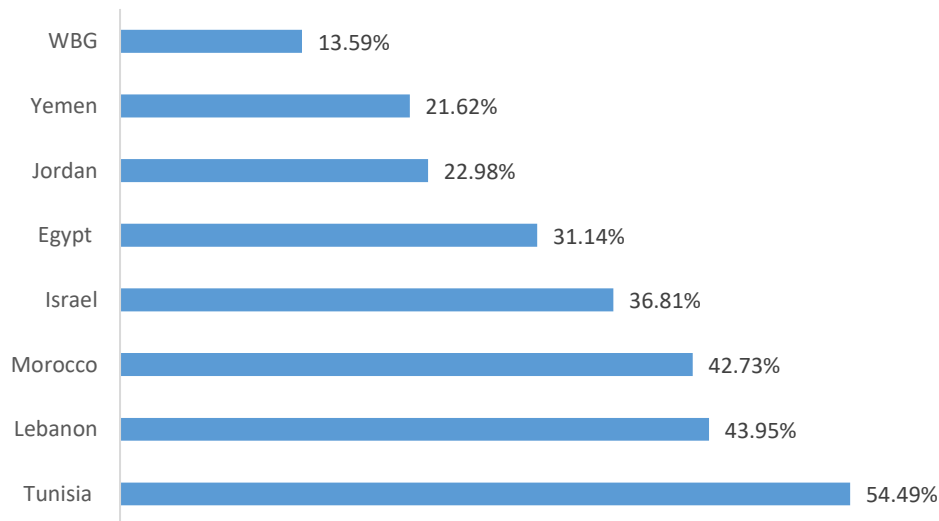
Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

Women entrepreneurship is the highest in export sectors like transport, publishing and printing, garments, plastic and rubber, exceeding the region average of 31.21%. Female entrepreneurship is the least represented in sectors like, furniture, non-metallic products, wood and metals. These findings echo, up to a certain point, the results for average female labor participation by sector displayed in Figure 4, for which women are most likely to work in exporting firms of sectors like garments, telecom and food, and are least represented in the workforce of exporting firms active in the wood, non-metallic products, metals and leather. A noteworthy exception is the plastic and rubber sector, where female employment is low (6.84%) and women entrepreneurship

is relatively high (33.52%). Another noteworthy exception is publishing and printing that appears on the top of list in women entrepreneurship but has a share of female labor participation of 12% which is below the region's average. In addition, it is worth mentioning that, in all sectors, the percentage of women-owned/managed exporting firms outweighs the percentage of female participation in the workforce.

Figure 7: Share of female-owned/managed exporting firms, by sector

Sector	Percentage
Transport	36.30%
Publishing printing and recorded media	36.02%
Garments	33.88%
Plastics & rubber	33.52%
Telecom	28.96%
Food	28.82%
Other manufacturing	28.54%
Construction	27.39%
Chemicals	26.58%
Machinery and equipment	26.25%
Hotels and restaurants	25.99%
Other services	25.56%
Leather	25%
Textiles	24.90%
Metals and Metal Products	19.58%
Wood	17%
Non metallic mineral products	17%
Furniture	16.94%
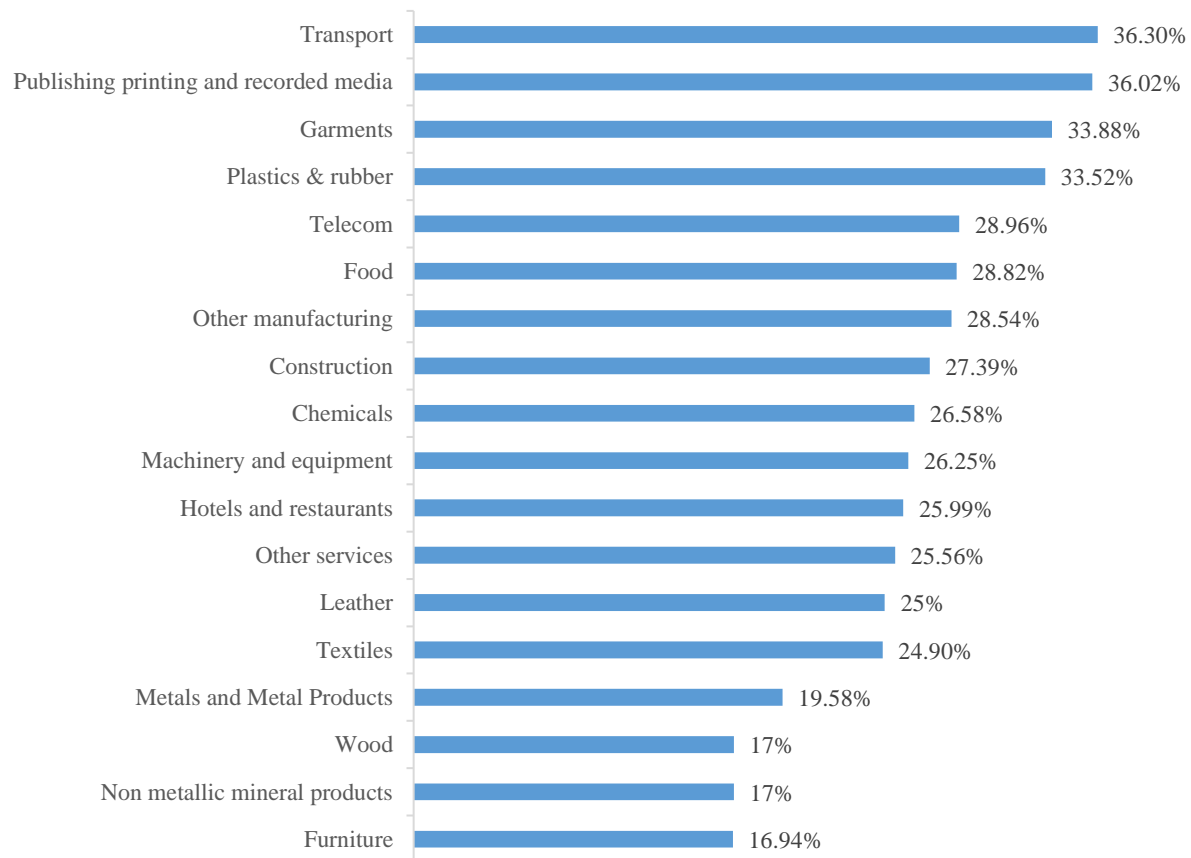
Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

Our sample shows that women entrepreneurship or management is the most represented in small exporting companies with less than 5 employees (39.29%) and large companies with more than 100 employees (37.48%) (Figure 3). The same pattern was observed in female participation in the workforce of exporting firms, as previously discussed in this section.
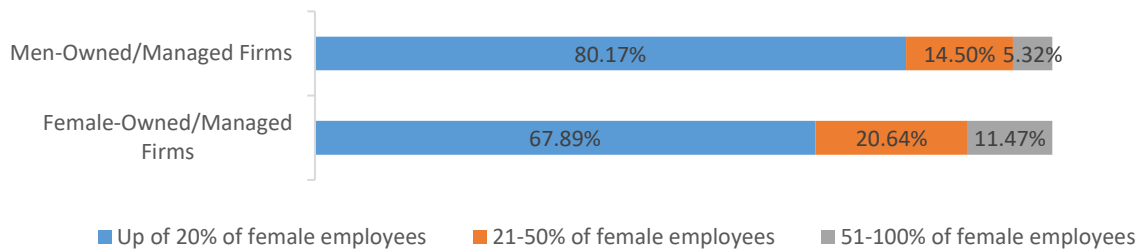
Figure 8: Women-owned/managed exporting firms, by firm size

Firm size	Percentage
more than 100 employees	37.48%
between 20 and 100 employees	33.42%
between 5 and 20 employees	20.03%
less than 5 employees	39.29%

Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

Last but not least, our sample supports the stylized fact that women-owned and managed companies employ more women (ITC, 2015). Indeed, Figure 9 shows that in the MENA region, the percentage of women-owned/managed companies with a share of female workers exceeding 50% is double the percentage of male-owned/managed companies (11.47% and 5.32% respectively). In addition, fewer women-owned/managed companies have a share of female workers below 20% than men-owned/managed companies, although the percentage of firms employing less than 20% females exceeds 50% for both categories.

Figure 9: Female labor participation in women-owned/managed exporting firms

	Up of 20% of female employees	21-50% of female employees	51-100% of female employees
Men-Owned/Managed Firms	80.17%	14.50%	5.32%
Female-Owned/Managed Firms	67.89%	20.64%	11.47%

Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

To summarize, seven key findings emerge from our analysis of firm-level data for selected MENA countries:

1- Women are weakly represented in the export sector.
2- Women representation's is the largest in small (less than 5 employees) and large companies (more than 100 employees).
3- Women are most likely to work in exporting firms of sectors like garments, telecom and food.
4- One in three exporting firm is led by women.
5- Women entrepreneurship is the highest in export sectors like transport, publishing and printing, garments, plastic and rubber.
6- Women mainly lead in micro (less than 5 employees) and large companies (more than 100 employees).
7- Women tend to employ more women.

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3. Methodology and Data

3.1. Methodology

The methodology used in this paper draws on the seminal work of Melitz (2003) - and its extensions - that accounts for the heterogeneity of firms' characteristics in explaining the export behavior of firms, to reflect producer-level facts highlighted in the new literature and not accommodated in trade models: first, in any industry, only few firms export, and exporters sell most of their output domestically. Second, exporters are bigger and more productive than non-exporters, and pay higher wages. Third, trade liberalization increases the average productivity level in an industry. (Aitken et al., 1997; Bernard et al., 1995; Bernard and Jensen, 1997, 1999 and 2004; Roberts and Tybout, 1997). Melitz' model with a fixed export cost shows that trade forces the least-productive firms to leave the domestic market, while high-productivity firms enter the export market. This mechanism contributes to a reallocation of market shares from low-productivity firms to high-productivity firms leading to an increase in the average productivity of this economy. Melitz's model and its extensions (Chaney, 2008; Helpman et al., 2008) show that exports respond to a decrease in trade barriers not only in terms of size (an increase in the intensive margin), but also in terms of variety (the set of exporters increases, an increase in the extensive margin).

Inspired from the above New-New Trade literature, our basic specifications of the determinants of trade margins in the MENA region is as follows:

$$Prob(X)_{ijk} = \alpha_1 \, X_{ijk} + \alpha_2 \, Ln(labprod)_{ijk} + \alpha_3 \, (Fem)_{ijk} + \; dsize + dst + dct + dloc + \varepsilon_{ijk} \quad (1)$$

$$Ln(X)_{ijk} = \lambda_1 \, X_{ijk} + \lambda_2 \, Ln(labprod)_{ijk} + \lambda_3 \, (Fem)_{ijk} + dsize + dst + dct + dloc + \varepsilon_{ijk} \quad (2)$$

Where $Prob(X)_{ijk}$ measures the extensive margin (the probability of becoming an exporter) and $Ln(X)_{ijk}$ measures the intensive margin (firm's export volume) of firm i in country j in sector k.

X is a vector of plant-characteristics that are believed to impact exports, such as firm age, foreign ownership and government ownership, and whether the firm has earned a foreign certification.

Firm age is also found to be positively linked to exporting (Roberts and Tybout, 1997; Aitken et al., 1997), in that the longer a firm has been in business, the more likely it is to look to export markets in order to grow. Firm age (*LnAge*) is calculated by taking the logarithmic of the difference between the date of the establishment of the firm and the date of availability of the data for our sample (2013). Yet, we can also expect a negative effect of age on exports since younger firms are generally more innovative and hence are more likely to export.

Foreign ownership is expected to positively affect the decision to export (Aitken et al., 1997; Bernard and Jensen, 2004) as foreign-owned firms usually export goods either back to headquarters or to other plants. Foreign ownership is logarithm of the share of capital owned by foreign parties *Ln(For.)*.

Furthermore, we believe it is reasonable to expect that firms that are mostly owned by the government are less export-oriented than their counterparts, and that firms acquiring foreign certifications are more likely to meet international standards and hence compete on international

markets. Therefore, we add the variable *Ln(Gov.)* that is the logarithm of the share of the firm's capital owned by the government; and a dummy variable *(Certif.)* taking the value of 1 if the firm has acquired a foreign certification, and 0 otherwise. We strongly believe that having a foreign certification can help firms export since they are more likely to meet international standards and hence more likely to compete.

We capture firm size by dummy variables that differentiate between micro firms (less than 5 employees), small firms (between 5 and 19 employees), medium firms (between 20 and 99 employees) and large firms (more than 100 employees), as defined in the World Bank Enterprise Surveys. Firm size is regarded to be positively related to the propensity to export (Roberts and Tybout, 1997; Aitken et al., 1997; Bernard and Jensen, 2004): larger firms can benefit from their size by engaging in economies of scale in production, have a greater ability to expand resources and absorb risks than smaller firms, and hence are more adaptable to export. Moreover, location[4], sectoral and country dummies (*dloc*, *dst* and *dct* respectively) are added to control for location, sector and country unobservable characteristics that can affect firm performance.

Ln(labprod)$_{ijk}$ represent the logarithm of labor productivity of firm i in country j in sector k. it is calculated by taking the logarithm of the ratio of the number of workers to sales volume (that have been deflated and converted into constant USD), and helps account for the above-mentioned producer-level fact, that exporters are more productive than their counterparts. Nonetheless, it is noteworthy that the literature on firm heterogeneity and trade tends to view firm productivity as endogenous to the firm's export status and volume. That is, export status and export volumes are both seen both as a factor influencing firm productivity, making all regression coefficients in Equations (1) and (2) biased. Therefore, we control for the endogenous characteristic of labor productivity by using a set of instruments that are exogenous to export, such as:

- *Formal Start.*: a dummy variable taking the value of 1 if the firm was formally registered when it began its operations, and 0 otherwise.
- *High. Educ.*: represents the highest level of education completed by the top manager of the firm.
- *Ln(Size Start)*: represents the number of full-time employees of the firm when it started its operations.
- *Power Outage*: represents the number of power outages experienced by the firm in a typical month during the last fiscal year. Indeed, Hulten, Bennathan, and Srinivasan (2006) show that power outages can significantly reduce output, as electricity is essential for lights, motors, and machines.

The first three variables tend to exert a positive effect on the productivity of the firm and therefore are likely to exert a positive effect on the probability of exporting (Melitz, 2003).

The endogeneity problem is tackled in a two-stage analysis. The first step predicts labor productivity of firm i in country j in sector k:

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[4] Location dummies refer to the governorate where the firm is located inside each country.

$Ln(labprod)_{ijk} = \beta_0 + \beta_1 (Formal\ Start.)_{ijk} + \beta_2 (High.\ Educ.)_{ijk} + \beta_3 Ln(Size\ Start)_{ijk} + \beta_4 (Power\ Outage)_{ijk} + dst + dct + dloc + \varepsilon_{ijk}$ (3)

We run several tests to assess the strength and validity of the above-mentioned instruments. Indeed, with a minimum Eigenvalue greater than all critical values, we reject the null hypothesis according to which our instruments are weak (p-value is also significant at 1%). Furthermore, both Sargan and Basmann tests show that we do not reject the null hypothesis that all over-identifying restrictions are jointly valid since the p-value is greater than the significance levels (1% or 5%). In the second step, the predicted value of labor productivity in Equation (3) is introduced in Equations (1) and (2).

The explanatory variables (*Fem*) of our interest are different dimensions of gender, such as $Ln(Fem.\ Work)_{ijk}$ that is the logarithm of the number of female full-time workers in firm i in country j in sector k; *Female Boss*$_{ijk}$ that is a dummy variable taking the value 1 if the firm is owned or managed by a female, and 0 otherwise; *Female Manager*$_{ijk}$ that is a dummy variable taking the value 1 if the firm is managed by a female, and 0 otherwise; *Female Owner*$_{ijk}$ that is a dummy variable taking the value 1 if the firm is owned by a female, and 0 otherwise. It is worth mentioning that *Female Owner*$_{ijk}$ captures the effect of women empowerment more than *Female Manager*$_{ijk}$, as the manager is an employee in the firm that take orders from the owner, while the owner is an entrepreneur that takes financial risk for his/her company.

Equation (2) may suffer from a selection bias given the fact that export volumes are only observed for exporting firms (around one-third of our dataset), i.e., firms that already compete on international markets. To control for this problem, we run a Heckman two-stage selection model. First, we examine the determinants of becoming an exporter, controlling for the determinants that affect the decision to export (Equation (1)). Then, we investigate the determinants of expanding export volumes for exporting firms (Equation (2)). It is noteworthy that $labprod_{ijk}$ is excluded from Equation (2), i.e. the second stage of the Heckman selection model, to account for the fact that labor productivity is a fixed export entry cost. According to Aboushady and Zaki (2019), total factor productivity represents a fixed entry cost to export markets, having a positive and significant effect on the probability of Egyptian firms to export, without affecting the firm's export volume.

In order to account for the gender stylized facts discussed in section 2, we extend our analysis in three directions. First, we add a dummy for firm size *Small* that takes the value of 1 for small and medium enterprises (SME)[5] (less than 100 employees), and the value of 0 for large (more than 100 employees) firms. *Small* is interacted with the gender variables to investigate whether the effect of women entrepreneurship and female labor participation on exports differs between SMEs and large firms. Second, we run the regressions at the sectoral level to differentiate between the effect of women entrepreneurship and participation between sectors. Third, to account for a stylized fact that women entrepreneurs face more financial and regulatory barriers than men, we control for access to finance through different variables: *Self-Finance*$_{ijk}$ that is the share of capital

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[5] The 3 categories of firm size (less than 5 employees, between 5 and 20, between 20 and 100) are aggregated in one category "small and medium enterprises", otherwise the number of observations drops significantly.

financed by own earnings, and its interaction term with *Female Boss$_{ijk}$*; *Finance$_{ijk}$* that is the share of capital financed by private financial institutions, and its interaction term with *Femaleboss$_{ijk}$*; *CreditLine$_{ijk}$* that is a dummy variable taking the value 1 if the firm has a credit line, and 0 otherwise, and its interaction term with *Femaleboss$_{ijk}$*. Regulatory barriers are proxied by a dummy variable *Website$_{ijk}$* taking the value 1 if the firm has a website, and 0 otherwise, and its interaction term with *Femaleboss$_{ijk}$*.

3.2. The Data

Firms data come from the World Bank Enterprise Surveys that offers an expansive array of economic data on 131,000 private firms in 139 countries. Formal (registered) companies with 5 or more employees are targeted for interview. Firms with 100% government/state ownership are not eligible to participate in an Enterprise Survey. The surveys cover a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures. The Enterprise Surveys Unit uses two instruments: the Manufacturing Questionnaire and the Services Questionnaire. The standard survey topics include firm characteristics, gender participation, access to finance, annual sales, costs of inputs/labor, workforce composition, bribery, licensing, infrastructure, trade, crime, competition, capacity utilization, land and permits, taxation, informality, business-government relations, innovation and technology, and performance measures. The manufacturing and services sectors are the primary business sectors of interest. This corresponds to firms classified with ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1). Services firms include construction, retail, wholesale, hotels, restaurants, transport, storage, communications, and IT.

Enterprise Surveys are available for 9 MENA countries: Djibouti, Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, Yemen for the year 2013[6]. Therefore, our sample contains 6327 manufacturing and services firms located in eight MENA countries, Djibouti being dropped due to the small number of observations. Manufacturing and services sectors have been aggregated in 18 sectors to increase the number of observations per sector.

Table 3 displays the number of firms by sector and country. It is noteworthy that 50% of the firms in our sample are concentrated in Egypt. The other countries have by far a lower percentage of firms than Egypt, with the highest for Tunisia and Jordan (that account each for almost 9% of the firms in our sample). Yemen is ranked last in terms of number of firms. Firms are mainly concentrated in "Other services" (23%) and far less in other sectors. "Other manufacturing" and "Food" are ranked second and third with 12.5% and 11.7% of the firms in our sample respectively. "Machinery and Equipment" are ranked last in terms of firm concentration.

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[6] Although there are several waves of data for the World Bank Enterprise Surveys, we run the analysis for 2013 that it is the only year for which the data are harmonized for MENA countries.

Table 3: Firms by country and sector

Sector	EGY	TUN	JOR	LBN	ISR	WBG	MAR	YEM	Total
Other services	300	136	128	224	185	188	120	147	1,428
Other manufacturing	193	121	197	37	41	12	96	95	792
Food	267	75	109	88	103	33	48	16	739
Garments	196	96	75	11	5	10	34	1	428
Metals and Metal Prod	357	14	2	7	11	18	13	2	424
Hotels and restaurant	166	32	24	51	6	41	20	37	377
Telecom	249	14	11	9	22	9	19	2	335
Textiles	236	6	1	4	1	5	7	1	261
Construction	125	20	2	18	34	9	21	1	230
Chemicals	174	6	2	13	13	9	3	2	222
Publishing printing a	122	6	7	30	5	7	7	2	186
Furniture	137	2	1	19	10	10	3	1	183
Plastics & rubber	134	2	1	12	4	15	7	1	176
Transport	1	48	26	11	18	30	8	4	146
Leather	105	2	1	6	1	3	1	1	120
Non-metallic mineral	60	2	1	9	3	23	1	1	100
Wood	83	1	1	3	1	9	1	1	100
Machinery and equipment	4	13	4	15	24	9	7	4	80
Total	2,909	596	593	567	487	440	416	319	6,327

Note: Constructed by the authors.

Figure 10 shows the percentage of exporters and non-exporters by sector in our sample. Only 33.47% of the firms are exporters, and the majority of the sectors are below average in terms of the share of exporting firms, with "construction", "metals and metal products", "hotels and restaurants" and "telecom" being at the bottom of the distribution with a share of 13.91%, 21%, 21.75% and 23.85% respectively. "Transport", "garments" and "machinery and equipment" show the highest share of exporting firms (50.68%, 55.84% and 71.25% respectively)[7].

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[7]A very close pattern of the one discussed in Table 3 holds for the number of exporting firms by sector and country. For the sake of brevity, the corresponding table has been omitted.

Figure 10: Share of Exporters and Non-exporters by sector
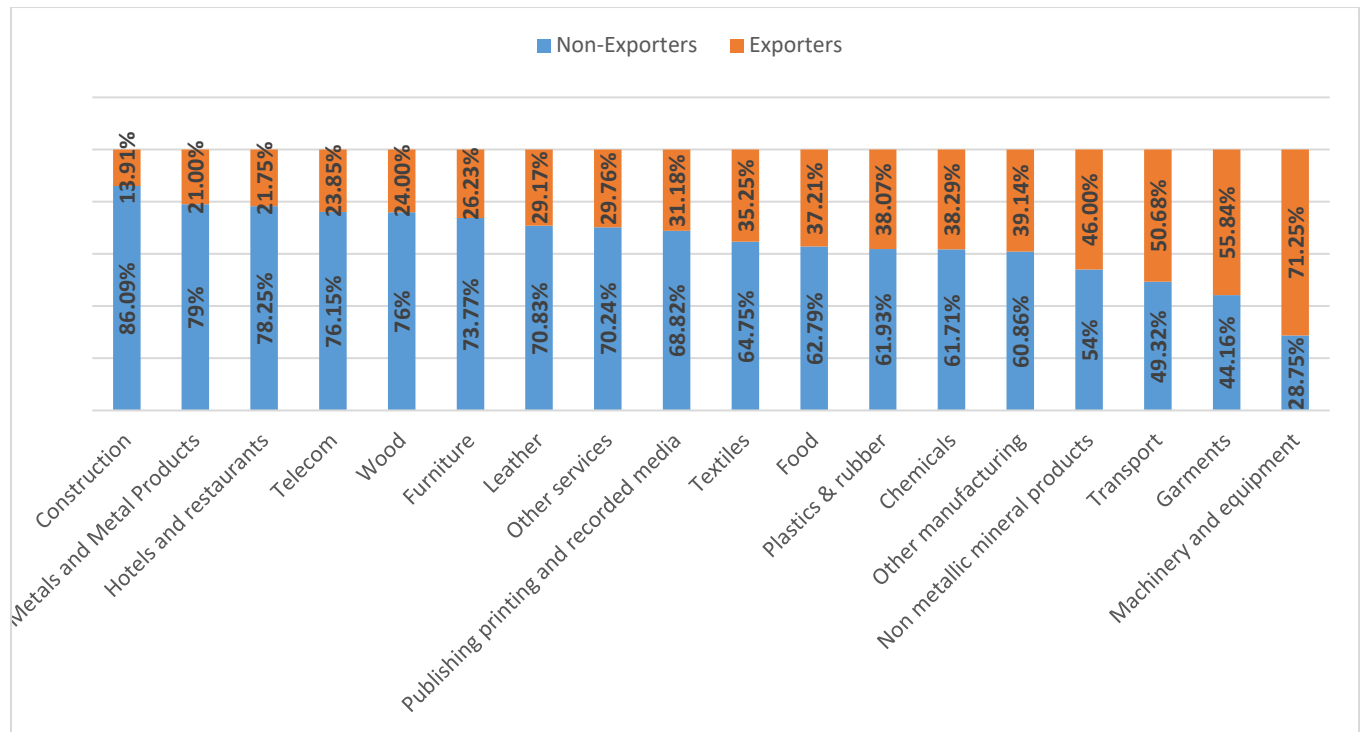
Source: Authors' Calculations from the World Bank Enterprise Surveys for 2013.

Table 4 provide the summary statistics for our variables. The average firm exports 30.56% of its total sales volume ($e^{3.42}$), has an average age of 19 years ($e^{2.93}$), employs an average of 3 female workers ($e^{1.14}$). The government and foreign parties own 1% ($e^{0.04}$) and 1.42% ($e^{0.35}$) of the average firm's capital, and 21% of firms have earned a foreign certification. More importantly, the summary statistics of the gender variables show that the average firm hires 3 female workers and 27% of firms are owned or managed by a female. Only 5% of firms are managed by a female while 26% are owned by a female.

Table 4: Sample Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Pb(X)	6,319	0.33	0.47	0	1.00
Ln(X)	1,603	3.42	1.13	0	4.61
Ln(labprod)	4,907	10.00	1.74	0.50	17.63
LnAge	6,244	2.93	1.21	0	7.61
Ln(Gov.)	6,151	0.04	0.38	0	4.61
Ln(For.)	6,158	0.35	1.17	0	4.62
Certif.	6,319	0.21	0.41	0	1.00
Ln(Fem. Work)	6,327	1.14	1.39	0	8.70
Female Boss	6,327	0.27	0.44	0	1.00
Female Manager	6,327	0.05	0.21	0	1.00
Female Owner	6,327	0.26	0.44	0	1.00

Note: Constructed by the authors.

4. Results

Table 5 displays the determinants of the extensive margin (i.e. the probability of exports) and the intensive margin of trade (i.e. export intensity of the firm). While foreign ownership exerts a positive and significant effect on exports as expected in the literature, firms' age and government ownership are not significant (columns 2 and 3). Foreign certification has a positive significant impact on the extensive margin only, suggesting that firms that acquire a foreign certification have a comparative export advantage over firms that are locally owned. More importantly, labor productivity has a significant positive impact on the probability of exports without having a significant impact on export volume, suggesting that labor productivity play the role of a fixed export cost. This finding is in line with the result of Aboushady and Zaki (2019), that total factor productivity represents a fixed entry cost to export markets, having a positive and significant effect on the probability of Egyptian firms to export, without affecting the firm's export volume.

However, as the literature on firm heterogeneity and trade tends to view firm productivity as endogenous to firm's exports, the coefficients of the regressions in columns 2 and 3 tend to be biased. We tackle the possible endogeneity problem by running a two-stage least regression model, where we first control for the endogenous characteristic of labor productivity by using a set of instruments that are exogenous to export (Table 6), then include the predicted value of labor productivity in the equations for the extensive and intensive trade margins (columns 4 and 5 of Table 5). The instruments have the expected signs, that is, the formal status of the firm, the highest level of education completed by the top manager of the firm, and the number of full-time employees of the firm when it started its operations, all have a significant and positive effect on labor productivity, while power outrage has a significant negative sign. Moreover, with a minimum Eigenvalue greater than all critical values, we reject the null hypothesis according to which our instruments are weak (p-value is also significant at 1%). And both Sargan and Basmann tests show that we do not reject the null hypothesis that all over-identifying restrictions are jointly valid since the p-value is greater than the significance levels (1% or 5%).

The coefficients of the second stage regression for the extensive trade margin (column 4 of Table 5) have all the expected signs, as discussed for column 2. Now, government ownership exerts a significant negative impact on the probability to export, as firms that are mostly owned by the government are generally less export-oriented than their counterparts. More importantly, labor productivity still has a significant positive impact on the probability of exports without having a significant impact on export volume, suggesting that labor productivity plays the role of a fixed export cost.

Table 5: Determinants of Trade Margins

	P(Exp)	Ln(Exp)	P(Exp) - IV	Ln(Exp) - IV
Ln(Lab Prod.)	0.0697***	0.0363	0.269**	-0.0886
	(0.0166)	(0.0287)	(0.107)	(0.146)
Ln(Age)	0.0389	-0.0374	0.0186	-0.0152
	(0.0237)	(0.0349)	(0.0262)	(0.0375)
Ln(Gov.)	-0.0770	0.0121	-0.234**	0.181
	(0.0572)	(0.0701)	(0.0993)	(0.169)
Ln(For.)	0.100***	0.0881***	0.0766***	0.0432
	(0.0181)	(0.0178)	(0.0244)	(0.0294)
Certif.	0.618***	0.0776	0.704***	0.0842
	(0.0564)	(0.0705)	(0.0746)	(0.0976)
Constant	-2.158***	0.909*	-3.633***	3.927***
	(0.293)	(0.271)	(1.062)	(1.468)
Size dum.	YES	YES	YES	YES
Loc dum.	YES	YES	YES	YES
Sector dum.	YES	YES	YES	YES
Country dum.	YES	YES	YES	YES
Observations	4,508	1,333	3,117	684
R-squared	0.245	0.917	0.257	0.160

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: First Stage Least Squared Regression for Labor Productivity

	Ln(Lab Prod.)
Formal Start.	0.278***
	(0.0953)
High. Educ.	0.509***
	(0.0684)
Ln(Size Start)	0.113***
	(0.0263)
Power Outage	-0.00315***
	(0.00100)
Constant	8.697***
	(0.199)
Loc dum.	YES
Sector dum.	YES
Country dum.	YES
Observations	2,627
R-squared	0.335

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Since labor productivity exerts a significant positive impact on the probability of exports, and not on export volume, and given that Equation (2) may suffer from a selection bias because export volumes are only observed for exporting firms, we run a Heckman two-stage selection model with $Ln(labprod)_{ijk}$ being the selection variable. We also investigate the effect of the gender variables on trade margins. The Heckman selection model (Table 7) gives support to the previous result, that labor productivity exerts a positive and significant impact on the extensive margin of trade. The presence of a foreign certification and foreign ownership have a positive and significant on the probability of export, and not on the export volume of the exporting firm, and therefore can be considered as a mean to overcome fixed export entry cost. The sign of government ownership is negative and significant as previously discussed, while the sign of the age variable is not significant.

Female Workers have a positive and significant impact on both trade margins, highlighting the positive correlation between female labor participation and the probability of the firm to enter the export market as well as expanding its sales on international markets. By contrast, the effect of female ownership or management represented by the variable *Female Boss$_{ijk}$* is not significant. This result gives supports to the common evidence that women face different impediments to trade and expand their sales on international markets, such as limited access to key inputs (land, finance, market information), and legal and regulatory barriers (ITC, 2015). The interaction variable between female workers and female ownership/management is not significant in both equations, suggesting that the effect of female labor participation on the intensive and extensive margin doesn't differ between female-owned/managed firms and male-owned/managed firms.

Table 7: Women and Trade Margins

	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV
Ln(Lab Prod.)		0.227**		0.278***		0.232**
		(0.109)		(0.107)		(0.109)
Ln(Age)	-0.0191	0.0164	-0.0138	0.0169	-0.0196	0.0163
	(0.0359)	(0.0264)	(0.0364)	(0.0262)	(0.0359)	(0.0265)
Ln(Gov.)	0.137	-0.264***	0.157	-0.235**	0.137	-0.266***
	(0.168)	(0.102)	(0.167)	(0.0993)	(0.167)	(0.102)
Ln(For.)	0.0186	0.0606**	0.0518*	0.0754***	0.0213	0.0621**
	(0.0298)	(0.0250)	(0.0304)	(0.0245)	(0.0299)	(0.0251)
Certif.	0.109	0.684***	0.138	0.704***	0.112	0.684***
	(0.139)	(0.0752)	(0.135)	(0.0748)	(0.135)	(0.0754)
Ln(Fem. Work)	0.158***	0.163***			0.157***	0.148***
	(0.0394)	(0.0288)			(0.0425)	(0.0328)
Female Boss			0.113	0.0405	0.0757	-0.0629
			(0.0822)	(0.0653)	(0.132)	(0.0981)
Fem Wor*Boss					-0.00118	0.0475
					(0.0532)	(0.0495)
Constant	2.915***	-3.242***	2.783***	-3.725***	2.859***	-3.281***
	(0.497)	(1.077)	(0.477)	(1.063)	(0.490)	(1.078)
Size dum.	YES	YES	YES	YES	YES	YES
Loc dum.	YES	YES	YES	YES	YES	YES
Sector dum.	YES	YES	YES	YES	YES	YES
Country dum.	YES	YES	YES	YES	YES	YES
Observations	3,115	3,115	3,115	3,115	3,115	3,115

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

To investigate one of the discussed stylized facts that firm size matters for women participation, we interact the gender variable with a dummy variable *Small* (Table 8) that takes the value of 1 if the size of the firm is small or medium (less than 100 employees), and 0 if the size of the firm is large (with more than 100 employees). The gender variable is Female Workers in columns (2) and (3), Female Boss in columns (4) and (5), Female Manager in columns (6) and (7), and Female Owner in columns (8) and (9). The variables on firms' characteristics have the expected sign, as previously discussed.

For Female Workers, the sign of the variable is positive and significant for both the extensive and intensive margins while the sign of the interaction variable is negative and significant for the extensive margin only. Therefore, the effect of female workers on the probability of the firm to export is lower for small and medium firms relatively to large firms, which gives support to documented evidence that large exporting companies employ a larger share of female workers than small exporting companies (ITC, 2015).

The Female Boss variable and its interaction term are both significant for the extensive margin only, with the sign being positive for female boss and negative for the interaction term. Therefore, the effect of female ownership/management on the probability of the firm to export is lower for small and medium firms relatively to large firms, supporting the widespread evidence that women

that own or manage small firms face different types of financial and regulatory barriers that impede their participation in international markets.

Female Manager and its interaction variable with the firm size are both insignificant for the intensive and extensive margins However, Female Owner exerts a positive and significant effect, and its interaction term a negative and significant effect only on the extensive margin of trade. Therefore, the positive effect of Female Boss in column (5) is driven by the effect of female ownership, and not female management, highlighting the potential importance of female empowerment in international trade.

Table 8: Women and Trade Margins, by firm size

	Female Workers		Female Boss		Female Manager		Female Owner	
	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV
Ln(Lab Prod.)		0.342***		0.503***		0.555***		0.503***
		(0.106)		(0.102)		(0.102)		(0.102)
Ln(Age)	-0.0226	0.0236	-0.00546	0.0320	-0.00588	0.0398	-0.00551	0.0315
	(0.0359)	(0.0262)	(0.0362)	(0.0256)	(0.0363)	(0.0254)	(0.0363)	(0.0256)
Ln(Gov.)	0.149	-0.281***	0.147	-0.236**	0.155	-0.227**	0.145	-0.237**
	(0.165)	(0.105)	(0.166)	(0.101)	(0.165)	(0.101)	(0.166)	(0.101)
Ln(For.)	0.0236	0.0598**	0.0542*	0.0858***	0.0500	0.0821***	0.0537*	0.0853***
	(0.0292)	(0.0251)	(0.0308)	(0.0244)	(0.0306)	(0.0243)	(0.0308)	(0.0244)
Certif.	0.0888	0.754***	0.204	0.848***	0.200	0.897***	0.202	0.846***
	(0.133)	(0.0731)	(0.147)	(0.0714)	(0.152)	(0.0702)	(0.147)	(0.0714)
Female	0.130***	0.238***	0.0697	0.450***	0.161	-0.205	0.0507	0.477***
	(0.0396)	(0.0271)	(0.125)	(0.108)	(0.458)	(0.342)	(0.127)	(0.109)
Female*Small	0.0483	-0.0664*	0.0953	-0.543***	0.0928	-0.116	0.0712	-0.586***
	(0.0441)	(0.0370)	(0.152)	(0.121)	(0.515)	(0.374)	(0.155)	(0.123)
Constant	2.790***	-4.273***	2.808***	-5.715***	2.848***	-6.230***	2.830***	-5.709***
	(0.353)	(1.037)	(0.342)	(1.009)	(0.341)	(1.002)	(0.340)	(1.009)
Loc dum.	YES	YES	YES	YES	YES	YES	YES	YES
Sector dum.	YES	YES	YES	YES	YES	YES	YES	YES
Country dum.	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,115	3,115	3,115	3,115	3,115	3,115	3,115	3,115

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Then, to account for the stylized fact that women tend to work in different export sectors than men, we run the regressions at the sectoral level (Table 9). The effect of Female Workers is positive and significant on the probability of firms to export in sectors like in food and other manufacturing. The effect of Female Workers is also positive and significant on the intensive margin of trade for firms operating in sectors like food, garments, textiles, and publishing. Those sectors are in general traditional and low-value added sectors, in which the MENA region has a comparative advantage. Therefore, job creation for women occurs in traditional export sectors and unfortunately, there is no room for job creation in non-traditional sectors.

Table 9a: Female Workers and Trade Margins, by sector

	Food		Garments		Textiles	
	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV
Ln(Lab Prod.)		0.199		0.401		0.680***
		(0.253)		(0.310)		(0.239)
Ln(Age)	0.114	-0.0560	-0.339***	0.0957	-0.00508	-0.0540
	(0.108)	(0.0925)	(0.114)	(0.0990)	(0.138)	(0.132)
Ln(Gov.)		-2.421	0.0275	3.174		-2.111
		(31,002)	(0.417)	(8.460e+08)		(7,384)
Ln(For.)	0.0718	0.0337	-0.0116	0.101	0.0750	0.121*
	(0.0746)	(0.0769)	(0.0648)	(0.0888)	(0.0810)	(0.0712)
Certif.	-0.202	0.772***	0.646**	1.830***	0.775*	1.461***
	(0.284)	(0.213)	(0.287)	(0.351)	(0.433)	(0.284)
Ln(Fem. Work)	0.258**	0.448***	0.120*	0.135	0.277***	0.0992
	(0.129)	(0.0748)	(0.0640)	(0.0825)	(0.101)	(0.103)
Constant	2.191***	-3.506	4.045***	-5.073*	2.073***	-7.126***
	(0.846)	(2.329)	(0.557)	(2.674)	(0.712)	(2.169)
Country dum.	YES	YES	YES	YES	YES	YES
Observations	315	315	176	176	174	174

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9b: Female Workers and Trade Margins, by sector

	Plastics & rubber		Publishing printing and recorded media		Other Manufacturing	
	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV
Ln(Lab Prod.)		0.721*		0.807		0.334
		(0.424)		(0.531)		(0.277)
Ln(Age)	0.124	0.110	0.0876	0.0646	0.111	0.0358
	(0.0852)	(0.0827)	(0.232)	(0.130)	(0.0872)	(0.0699)
Ln(Gov.)					0.0906	-0.174
					(0.258)	(0.176)
Ln(For.)	-0.176	0.0742	0.266**	0.0918	0.0413	0.0975
	(0.125)	(0.129)	(0.121)	(0.127)	(0.0931)	(0.0780)
Certif.	-0.398	0.746**	0.139	0.946***	-0.547*	0.679***
	(0.359)	(0.318)	(0.492)	(0.360)	(0.284)	(0.224)
Ln(Fem. Work)	0.0809	0.0697	0.281*	0.205	0.165	0.330***
	(0.111)	(0.115)	(0.163)	(0.134)	(0.107)	(0.0885)
Constant	2.749***	-8.246**	1.574	-8.960*	2.651***	-4.870*
	(0.819)	(3.949)	(1.348)	(4.789)	(0.858)	(2.643)
Country dum.	YES	YES	YES	YES	YES	YES
Observations	115	115	107	107	306	306

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 looks at female labor participation in services. A dummy variable Services is created, taking the value 1 if the sector is a service sector, and 0 otherwise. This dummy variable

is also interacted with Female Workers. The coefficient of Female Workers is positive and significant in both regressions, while the interaction term has a negative sign that is only significant in the extensive margin equation. Therefore, the effect of female workers on the probability of export for the firm decrease for services sectors, relative to manufacturing sectors. A possible explanation of this finding is that women tend to work in non-tradable sectors like education for example.

Table 10: Female Workers and Trade Margins in Services

	Ln(Exp)	P(Exp) - IV
Ln(Lab Prod.)		0.133**
		(0.0645)
Ln(Age)	-0.0140	0.0142
	(0.0361)	(0.0260)
Ln(Gov.)	0.102	-0.307***
	(0.169)	(0.100)
Ln(For.)	0.0131	0.0660***
	(0.0302)	(0.0246)
Certif.	0.0673	0.683***
	(0.138)	(0.0731)
Ln(Fem. Work)	0.179***	0.220***
	(0.0443)	(0.0303)
Services	-0.0877	-0.0865
	(0.152)	(0.0960)
Fem*Ser	-0.0208	-0.171***
	(0.0705)	(0.0501)
Constant	3.267***	-2.675***
	(0.523)	(0.621)
Size dum.	YES	YES
Loc dum.	YES	YES
Country dum.	YES	YES
Observations	3,115	3,115

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 11 investigates some financial and regulatory barriers faced by women-owned/managed firms in the export sector. Columns (2) to (7) tackle different dimensions of financial barriers such as $Self\text{-}Finance_{ijk}$ that is the share of capital financed by own earnings, $Finance_{ijk}$ that is the share of capital financed by private financial institutions, and $CreditLine_{ijk}$ that is a dummy variable taking the value 1 if the firm has a credit line, and 0 otherwise. Each barrier is then interacted with $Femaleboss_{ijk}$. None of the interactive terms are significant, which contradict common evidence that women entrepreneurs in the MENA region face more financial and regulatory barriers than their male counterparts.
Columns (8) and (9) look at the availability of a website for the company as a proxy for regulatory barriers faced by the firm, and its interaction term with female boss. While the coefficient of the dummy variable Website is positive but insignificant in the extensive margin equation, the sign of

the interaction term is positive and significant, suggesting that the presence of a website exerts a positive impact on the access of the firm to international markets more for female-led firms than their male counterparts. This result may be explained by the fact that female-led firms face more regulatory barriers than their male counterparts to access the export market and therefore rely on creating a website for their company to ease the international access to their firm's information.

Table 11: Women, Trade Margins and Finance

	Self-Finance		Finance from a priv. inst.		Credit Line		Website	
	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV	Ln(Exp)	P(Exp) - IV
Ln(Lab Prod.)		0.296***		0.326***		0.268**		0.139
		(0.109)		(0.110)		(0.109)		(0.111)
Ln(Age)	-0.0215	0.0155	-0.0209	0.0257	-0.0247	0.00729	-0.0138	0.0257
	(0.0369)	(0.0269)	(0.0373)	(0.0274)	(0.0392)	(0.0276)	(0.0365)	(0.0269)
Ln(Gov.)	0.169	-0.246**	0.160	-0.250**	0.216	-0.280**	0.164	-0.206**
	(0.168)	(0.0997)	(0.169)	(0.0999)	(0.190)	(0.109)	(0.167)	(0.101)
Ln(For.)	0.0479	0.0713***	0.0505	0.0701***	0.0635**	0.0828***	0.0536*	0.0819***
	(0.0306)	(0.0250)	(0.0309)	(0.0253)	(0.0318)	(0.0253)	(0.0312)	(0.0248)
Certif.	0.141	0.727***	0.116	0.699***	0.172	0.732***	0.0983	0.599***
	(0.138)	(0.0762)	(0.140)	(0.0773)	(0.140)	(0.0770)	(0.132)	(0.0765)
Female Boss	-0.203	0.329	0.120	0.0454	0.0323	0.0499	-0.0694	-0.0405
	(0.309)	(0.253)	(0.102)	(0.0761)	(0.111)	(0.0805)	(0.182)	(0.117)
Variable	0.0748	-0.0717	-0.0108	-0.0135	0.209	-0.0583	0.202	0.0564
	(0.0739)	(0.0598)	(0.0469)	(0.0409)	(0.166)	(0.137)	(0.202)	(0.140)
Boss* Variable	-0.0444	0.0559	0.0281	0.0329	-0.165	0.0128	0.0883	0.509***
	(0.0529)	(0.0376)	(0.0335)	(0.0282)	(0.118)	(0.0923)	(0.143)	(0.0797)
Constant	2.880***	-4.158***	2.715***	-4.197***	2.720***	-3.647***	2.796***	-2.638**
	(0.555)	(1.086)	(0.500)	(1.087)	(0.485)	(1.075)	(0.554)	(1.090)
Size dum.	YES	YES	YES	YES	YES	YES	YES	YES
Loc dum.	YES	YES	YES	YES	YES	YES	YES	YES
Sector dum.	YES	YES	YES	YES	YES	YES	YES	YES
Country dum.	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,060	3,060	2,949	2,949	3,042	3,042	3,107	3,107

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In sum, our results show that first, female workers have a positive a significant impact on both the probability of export and export volume, with this effect on the probability of the firm to export being lower for small and medium firms relatively to large firms. Female labor participation matters in traditional sectors where the MENA region has a comparative advantage.
Second, while the effect of female ownership or management is not significant on trade margins, female management/ownership seems to matter more for the probability of large firms to export. This positive effect is mainly driven by female ownership and not management, and thus sheds light on the potential importance of female empowerment in international trade.
Third, there is no statistical evidence that female-owned/managed firms face more financial constraints to export than their male counterparts. The effect of other regulatory barriers on

exports, such as having a website for the company, is more pronounced for female-owned/managed firm, with respect to a men-owned/managed firm.

5. Conclusion and Policy Implications:

This paper investigates the contribution of female labor participation as well female ownership/management to the extensive margin (the probability of trade) and intensive margin (volume of trade) in the MENA region. This topic is timely and critical for the MENA region where female labor participation as well as female entrepreneurship are shy. Indeed, more than half of MENA exporting firms have a female participation rate lower than 20%, and only 21% of exporting firms are owned or managed by women (ITC, 2015). At the same time, afflicted by conflicts, political and economic instability, the region is looking for new sources of competitiveness to stimulate exports and economic growth. The latter must rely on human resources rather than on the natural resources relied on in the past. Women remain a huge, untapped reservoir of human potential for countries in the region (Nabli and Nedereh, 2004). A potential source of unexploited growth resides in the participation of the region's female workforce in international trade.

To our knowledge, this paper is the first attempt to tackle the issue of women's contribution to trade in general, and to trade margins in particular. Since women participate in trade as employees or entrepreneurs of exporting firms, we have recourse to firm level data and get inspired from the seminal work of Melitz (2003) and its extensions. Melitz highlights the importance of firm heterogeneity in terms of productivity and a fixed cost of entering export markets in determining the number and the type of firms that become exporters as well as the gains from trade. Extensions of the Melitz's (2003) model explicitly account for the decision to export - the extensive margin of trade (Chaney, 2008; Helpman et al., 2008; Melitz and Ottaviano, 2008). We use the World Bank's Enterprise Surveys Database that gathers information on private firms operating in 18 manufacturing and services sectors for 8 MENA countries (Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, Yemen) in 2013.

Our results show that first, female workers have a positive a significant impact on both the probability of export and export volume, with this effect on the probability of the firm to export being lower for small and medium firms relatively to large firms. Female labor participation matters in traditional sectors where the MENA region has a comparative advantage. Second, while the effect of female ownership or management is not significant on trade margins, female management/ownership seems to matter more for the probability of large firms to export, which this effect being mainly driven by female ownership and not management. This result highlights the importance of female empowerment in international trade. Third, there is no statistical evidence that female-owned/managed firms face more financial constraints to export than their male counterparts. The effect of other regulatory barriers on exports, such as having a website for the company, is more pronounced for female-owned/managed firm, with respect to a men-owned/managed firm.

The policy implications of our results are important for the MENA region from a development perspective. First, female labor participation is positively correlated to firms' probability of export and export volume, but this effect on the probability of export is lower for SMEs than for large firms. Second, female entrepreneurship matters more than female management for the probability of large firm to become an exporter. Third, statistical evidence shows that female owners/managers face more regulatory barriers than their male counterparts to enter international markets. Therefore, it is recommended that policies in the MENA region enhance female labor participation in tradable sectors and contribute to decreasing the impediments to trade faced by women entrepreneurs. This will ensure that trade policies contribute effectively to growth and development, and also supports the achievement of gender equality goals.

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