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Financial Inclusion and Barriers to Funding Micro-Entrepreneurs  
in MENA Countries Prior and During the COVID-19 Pandemic

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The usual disclaimer applies.

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## ***Financial Inclusion and Barriers to Funding Micro-Entrepreneurs in MENA Countries Prior and During the COVID-19 Pandemic***

### **Abstract**

Factors detrimental to financial inclusion (account holding and borrowing) regarding female entrepreneurs come both from the demand side of businesses, such as the absence of funding need *versus* self-selection despite account holding, and from the supply side of financial institutions, such as deficient financial infrastructure and discrimination towards loan applicants. A sequential model takes care of both the demand and the supply sides, including descriptive statistics prior and during the COVID-19 pandemic, upon four MENA countries, namely Egypt, Jordan, Morocco and Tunisia.

Probit regressions (marginal effects) analyse financial inclusion from the demand side, using two different but somehow comparable sub-samples of micro enterprises the 2020 World Bank Enterprise Survey (WBES) and the Economic Research Forum (ERF) COVID-19 Monitor in 2021.

We address (female) micro-entrepreneurs' self-selection (i) prior and (ii) during the COVID-19 pandemic, as well as discrimination (iii) prior and (iv) during the pandemic.

Prior the pandemic, microenterprises are prone to self-selection *vis-à-vis* loan application in Tunisia (ERF) and in all countries from North Africa (WBES). During the pandemic, there is no self-selection *vis-à-vis* government support affecting either gender or micro-entrepreneurs. Prior the pandemic, females or micro-entrepreneurs do not face discrimination in loan application (WBES). During the pandemic, females are not subject to discrimination as for government support, whereas Moroccan micro-entrepreneurs do face discrimination (ERF).

Prior the pandemic, financial inclusion runs opposite to both self-selection and discrimination (WBES), but not for self-selection (ERF), whereas it proves insignificant during the pandemic with respect to self-selection or discrimination, whatever the sub-sample. Hence, financial inclusion may not preclude self-selection or discrimination, which remain obstacles to business growth of micro-entrepreneurs that policies enhancing funding should help overcome.

**Keywords:** Discrimination; Micro-enterprises; Financial inclusion; Gender; Loans; MENA countries; Probit regressions; Self-selection.

**JEL Classification:** D1; D8; D22; G2; G4.

## **Introduction.**

A key factor in socio-economic development through poverty alleviation together with rising sustainable economic growth (Ayadi et al, 2021), financial inclusion targets vulnerable economic groups such as (female) micro-entrepreneurs, with a focus on bank account holding and loan granting.

Ndoye & Barajas (2022) point out a large gap between the (high) share of account holding and the (small) share of borrowing SMEs in the MENA region. This is unsurprising because financial inclusion is both a potential and a real endowment. On the one hand, whenever an entrepreneur holding a bank account does not apply for a loan despite the need for it, there is self-selection, which may be due to the fear of failure, the lack of financial literacy or else. On the other hand, entrepreneurs holding a bank account can be denied a loan application and face credit rationing because they lack sufficient risk coverage (i.e., collateral). Thus, potential endowment does not transform into real access. In addition, if female entrepreneurs are denied access to a loan application, although they have the same characteristics than males whose loan application is granted, there is gender discrimination.

As for the pre-COVID-19 period, small businesses applying for a loan did face credit rationing and lack of sufficient collateral requested by the banks, an amount that varies across countries. According to Global Findex, figures for financial inclusion improved in 2017, but slightly declined in 2021, presumably due to the impact of the pandemic (Global Findex 2021, See Table A1 in the Appendix).

Delechat et al (2018) use OLS and probit regressions upon a worldwide sample from Findex database and a single index for financial inclusion. They find that legal discrimination against women and gender norms explain part of the cross-country variation in access to finance for women. Evidence of gender bias in financial inclusion could help explain the relationship between gender inequality and macroeconomic outcomes. However, inequality does not necessarily mean discrimination.

The COVID-19 pandemic outbreak in 2020 stands as a as a test of the financial behaviour of these two categories, with respect to government support programs in MENA countries for which Krafft et al (2021) provide an overview. Over half of firms in each country –Tunisia (52%), Jordan (59%), Egypt (65%) and Morocco (67%) reported they had not applied for/received any government assistance. However, from 7% in Tunisia to 30% in Egypt declared that no government support was needed. Business loans were the most common categories of support received and needed, whereas reduced and delayed taxes were the next

most common support applied for/received (20-24%) and needed (15-24%) across countries. The need for wage subsidies was reported by 28% Tunisian and 35% Moroccan businesses, while 17% of Jordanian firms often applied for or received delays in social insurance payments. Noteworthy is that support received is not disentangled from support needed.

The research issue is twofold and addresses distinct periods, prior and during the COVID-19 pandemic. First, the gender issue: Are female entrepreneurs prone to self-selection? Do they face discrimination when they apply for a loan and/or financial support? Second, the size issue: Are micro-enterprises prone to self-selection? Do they face discrimination when they apply for a loan and/or financial support?

The paper is structured as follows.

Section 1 tackles the literature review and stylised facts upon financial inclusion, especially gender inclusion for female entrepreneurs. Various causes may explain financial exclusion regarding the demand side of borrowers (insufficient income, absence of funding need *versus* self-selection and available substitutes to bank loans) and with respect to access on the supply side of financial institutions (poor financial infrastructure, credit rationing and discrimination towards loan applicants).

Section 2 provides an inventory of data sources on the demand-side addressing businesses from the World Bank Enterprise Surveys (WBES 2020) as well as entrepreneurs from households ERF-COVID-19 Monitor (OAMDI 2021). A sequential model design includes descriptive statistics before and in the wake of the COVID-19 shock with respect to MENA countries.

Section 3 analyses financial inclusion, using probit regressions (marginal effects) upon two distinct data sets: the 2020 WBES pooled sub sample of 1,430 micro-enterprises and the ERF-COVID-19 pooled sub-sample of 1,979 micro-entrepreneurs. It investigates the following issues: are micro- enterprises and female entrepreneurs confronting self-selection and/or discrimination from lenders prior and during the COVID-19 disruption?

Section 4 is devoted to conclusions and policy recommendations. The focus is on harmonised data collection and funding enhancement from financial institutions, such as extending guarantee scheme for borrowers, regulating crowdfunding and promoting positive discrimination towards female entrepreneurs. In this respect and although it is no panacea, microfinance institutions are a key vector for financial inclusion, fostering female entrepreneurship in a sustainable way.

## **1. Literature review**

### **1.1. Financial inclusion**

A literature review and stylised facts from indicators address financial inclusion regarding (small) businesses and female entrepreneurs. Financial inclusion (account holding) remains only a potential endowment, if use does not occur on the demand-side of entrepreneurs, due to the absence of funding need or self-selection, despite the need for a loan.

Factors transforming financial inclusion (account holding) into real financial exclusion (loan application denial) come from the supply side of financial institutions if available financial infrastructure is deficient, and if there is discrimination towards loan applicants.

Villaseca et al (2021) observe that funding requests from female entrepreneurs to business angels (*AngelList* platform) amount only to 16% of total requests, and there is lower female access to venture capital. Yet, these observations do not necessarily imply gender discrimination. Gafni et al (2021) point out a larger participation of women entrepreneurs (35%) to the non-representative *Kickstarter* crowdfunding platform and no evidence of discrimination. At the macroeconomic level, financial inclusion (i.e. financial intermediation), has a positive correlation with growth, employment, poverty and a reduction in inequality. At the microeconomic level, financial inclusion (access to financial services) has a positive effect on employment and on household consumption, and stimulates the local economy. This is a major issue in MENA countries, wherein the unemployment rate is high -especially among youth and the number of informal businesses is large (Adair et al 2022). A substantial share of enterprises in MENA countries do not register with their national business (tax) registry (Gatti et al 2014).

### **1.2. Self-Selection from the Demand-Side**

According to the Global Entrepreneurship Monitor (GEM 2017), women have a lower propensity for borrowing than their male counterparts have and rely more on informal sources such as funds from family and friends. The pecking order theory (Myers 1984) suggests that female entrepreneurs opt first for internal financing rather than borrowing. Watson (2012) states that female entrepreneurs are more prone to risk aversion than men are, driving self-selection, a controversial hypothesis that may depend on job position datasets and countries, which proves plausible among MENA countries.

GEM provides a household survey upon Entrepreneurial Attitudes and Perceptions. Checking GEM reports up to 2021 for the four selected MENA countries, we found that Tunisia has not been surveyed since 2012. Deng et al (2021), found no paper addressing female entrepreneurship in the MENA countries among the top 20 countries over 1975-2018.

Aljuwaiber (2021) selected a data set of 271 articles on entrepreneurship in MENA countries over 2009-2019, “female entrepreneurship and gender” was the dominant topic, with 69 papers, among which only eight papers tackled the funding issue.

Morsy et al (2019) analyse North Africa (Egypt, Mauritania, Morocco and Tunisia), using a pooled sample of 6,097 registered firms with at least five employees from several WBES. A multinomial logistic regression finds no evidence of gender discrimination, whereas an instrumented probit model highlights self-selection, combining low perceived creditworthiness and female risk aversion.

Berguiga & Adair (2021) draw a pooled sample of 3,896 businesses in Egypt, Morocco and Tunisia from the 2013 WBES, including microenterprises and making a distinction between managers and owners that Morsy et al (2019) overlooked. Two logistic regressions show there is neither self-selection nor discrimination for female owners, whereas self-selection affects female managers.

### **1.3. Discrimination from the Supply Side**

Two theories address discrimination. According to Becker (1957), taste-based discrimination is due to a prejudice towards one group of applicants based on gender and other personal characteristics. Phelps (1972) grounds statistical discrimination upon information asymmetry. Applying these theories to the credit market, lenders reject some loan applicants based on observed characteristics such as gender, which are supposed to predict their creditworthiness. Evidence proves controversial. Hereafter, we contend that there is no gender discrimination if banks require women to hold a bank account and provide a collateral exactly as they require these lending conditions from men. Discrimination occurs if female entrepreneurs with the same characteristics as their male counterparts are denied a loan when they apply for it.

On the one hand, no discrimination affects female entrepreneurs as for developing countries Bardasi et al (2011) analyse a sample of over 20,000 firms from 61 developing countries, based on WBES from 2005 to 2007, wherein the MENA region is not included. A multinomial logit model addresses the following categories: a) businesses that do not need a loan, b) those that need a loan but do not apply for it, c) those that need a loan and apply for it; in the latter case, either the loan application is approved, or it is dismissed. They do not document gender discrimination in access to bank funding.

Hewa-Wellalage et al (2022) use a cross-section sample of 8,921 businesses from WBES and World Bank COVID-19 follow-up surveys upon 19 mostly developing countries, wherein only one MENA country (Morocco) is included. Applying an Heckprobit as well as propensity score

matching and Blinder-Oaxaca decomposition, authors find no evidence of discrimination. In contrast, micro firms and female entrepreneurs are slightly favoured over larger firms and their male counterparts, suggesting that financial institutions prefer less risky female borrowers.

On the other hand, discrimination occurs for female business owners/managers.

Carco et al (2017) depict a non-representative sample of 583 female entrepreneurs collected in six MENA countries. Female entrepreneurs, mostly university graduates, enjoy 10 years of experience and are aged 40 on average. Their family-based businesses operate in the services, trade and craft industries. The share of non-registered businesses is over one third in Egypt, whereas it is only four to 10% in Morocco and Tunisia. As for access to financing, the difficulty of being a female entrepreneur compared to being a male entrepreneur is lowest in Egypt (19.80%) and Tunisia (25.70%), and highest in Morocco (49.50%).

Berguiga & Adair (2022) use a pooled sample of 6,253 enterprises from the 2019 WBES upon six MENA countries (Egypt, Jordan, Lebanon, Morocco, Palestine and Tunisia). Two logistic regression models address loan demand and loan supply, with respect to self-selection vs. discrimination of both owners and managers according to gender. There is no self-selection for female owners and managers, but discrimination occurs for female owners.

## **2. Data sources and model design**

Noteworthy is that the classification of micro and small enterprises across the four MENA countries (Ayadi & Sessa 2017; UNDP 2021) does not always match the standards coined by the ILO and the UN System of National Accounts as follows: *Micro* (1-9 employees), *Small* (10-49 employees), *Medium-size* (50-249 employees) and *Large* (over 250 employees). In Egypt, according to the Central Bank of Egypt, the structure of firms is the following: *Micro* (below 10 employees), *Small* (10-49), *Medium* (50-199) and *Large* (over 200 employees). In Jordan, according to the Department of Statistics, the distribution of enterprises is broken down into *Micro* (below five employees), *Small* (5-19), *Small-Medium* (20-49), *Medium* (50-99) and *Large* (over 100 employees). The Moroccan national statistical office (Haut Commissariat au Plan), does not compile data on the structure of enterprises. The Tunisian National Business Registry includes *Micro* (up to five employees), *Small* (6-49), *Medium-size* (50-199) and *Large* businesses (over 200 employees).

Bearing in mind that microenterprises are the most widespread category of businesses and in order to minimise threshold cut-offs, we focus hereafter on microenterprises (1-9 employees).



## 2.1. Data sources

Several data sources address business funding behaviour in the four MENA countries from both the demand side and the supply side in the recent pre-COVID 19 period and during the pandemic. However, only two data sources documenting the demand side prove relevant, although not always representative and they cannot be pooled because they do not include the same characteristics (e.g. gender).

World Bank Enterprise Surveys (WBES 2020) conducted in 2019 provides a pooled sub-sample of 1,430 microenterprises (MEs) in Tunisia, Morocco, Jordan and Egypt. WBES is biased by prominent manufacturing industry (over half the firms), overrepresentation of Egypt (three out of five firms) and the absence of unregistered businesses, which account for the majority of enterprises (Ayadi et al 2017; Berguiga & Adair 2019). WBES figures display rather large account holding (over three out of five companies own a bank account) but little use of bank loans (less than one out of thirteen companies) by MEs. The sub-sample is non-representative (See Table A4 in the Appendix).

Five waves surveyed by the ERF in 2021 (OAMDI 2021b) upon a stratified households data set encapsulated a sub sample of 1,979 non-farming MEs business owners, whose financial behaviour prior and during the COVID-19 pandemic, including the impact of government support, was assessed. Prior COVID-19, financial inclusion is one third lower, whereas self-selection is twice as higher (almost two thirds) than in the WBES. Personal loan is widespread (over two out of five businesses), five times higher than in the WBES sub-sample. There is also a country effect: Morocco accounts for two out of the sub-sample, twice as much as Egypt.

Last, both sub-samples include a similar share of female owners, 10.28% as for WBES and 12.38% in the ERF (See Table A4 in the Appendix).

Financial Access Survey (FAS) collected by the International Monetary Fund records macroeconomic aggregates on the supply side, which provides little help for investigating financial behaviour from lenders. Noteworthy is that the number of SMEs borrowing from commercial banks receded between 2017 and 2020, whereas the number of branches increased alongside the number of borrowers and outstanding deposits (See Table A2 in the Appendix).

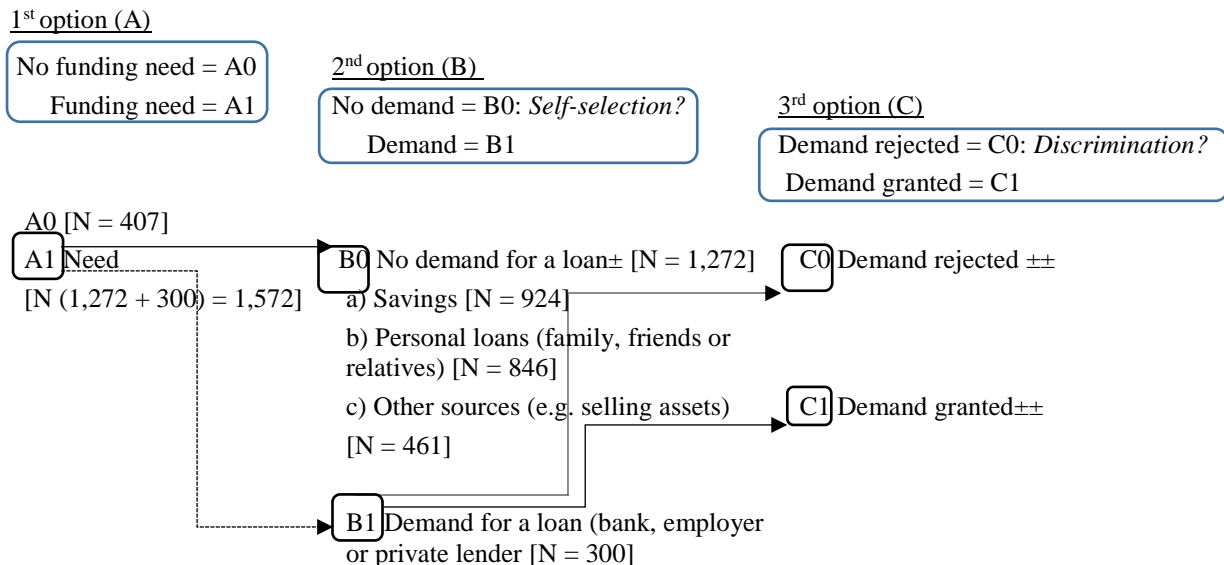
The ERF conducted three waves upon a stratified sample of enterprises (OAMDI 2021a); unfortunately, lacking variables, (e.g. gender ownership) precluded tackling gender differentials.

AWBES COVID-19 Monitor (WBES 2021) took place in Morocco and Jordan, yet a data source not used in the paper, due to too small a sample size.

## 2.2. Model design

We design a sequential choice model best represented with a decision tree, which includes three binary options: (A) no funding need vs. funding need prior to (B) no funding application (self-selection) vs. funding application and (C) funding denied (potential discrimination) vs. funding granted (See Figure 1, Figure 2 and Box 1 hereafter). Noteworthy is that the final choice in option C does not stand on the borrowers' demand side, but on the lenders' supply side.

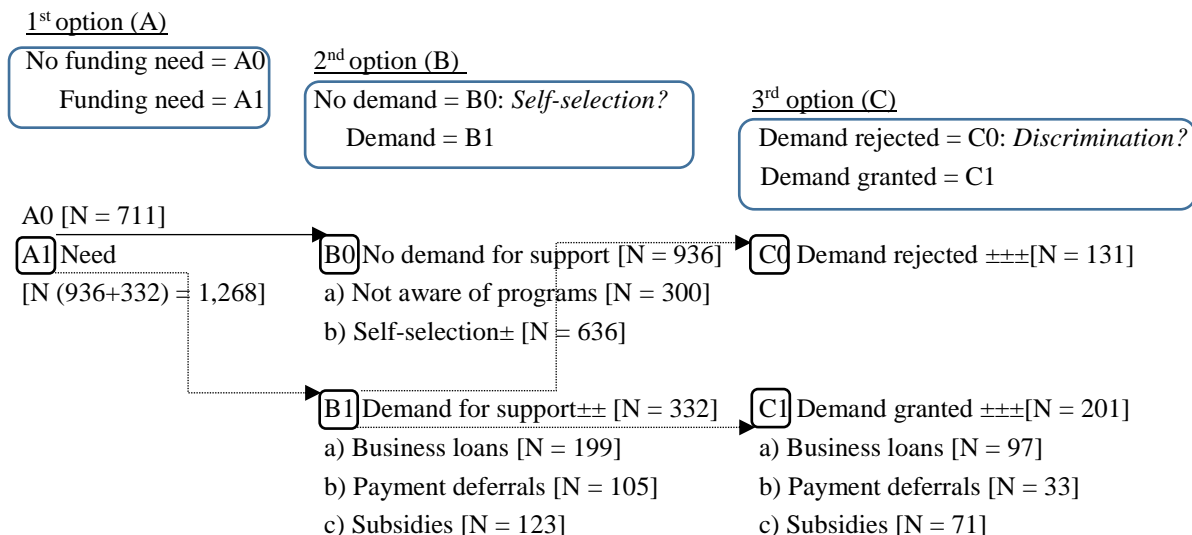
**Fig. 1. Decision tree: the sequential funding model prior COVID-19 (ERF sub-sample)**



*Note:* Sample (N= 1,979) ± Preferences for alternate funding sources suggest self-selection towards borrowing. Several funding sources can combine. ±± Not available.

*Source:* Authors' calculations from OAMDI (2021b) for the four MENA countries.

**Fig. 2. Decision tree: the sequential funding/support model during COVID-19 (ERF sub-sample)**



*Notes:* Sample (N= 1,979) ± Requires internet/smart phone (have none) + Don't think will get support + Need to pay bribe to get support + Others. ±± Several supports can combine. +++ Not available. We compile C0 and C1 from cross sorting with the answers to the question addressing the best policy required to support business activity, (a), b) or c). If the answer is positive, we assume that the application was accepted (C1), otherwise rejected (C0).

*Source:* Authors' calculations from OAMDI (2021b) for the four MENA countries.

Probit regressions (marginal effects) apply to both sub-samples (WBES and ERF) and address the research issues prior and during the COVID-19 pandemic. After first estimations, country control variables were included to check the robustness of results and capture the country effect (Table A5). *Country dummies* slightly weaken the estimations.

**Box 1. Probit models (marginal effects)**

The funding/support demand model is binary and self-selection comes from the absence of application (=0) as follows:

**Self – selection**<sub>ik</sub>

$$= \begin{cases} 0 & \text{if funding/support was needed and not applied for in 2019/2020 and 2021} \\ 1 & \text{if funding/support was needed and applied for in 2019/2020 and 2021} \end{cases}$$

The funding/support supply model is binary and discrimination comes from the denial of application (=0) as follows:

**Discrimination**<sub>ik</sub>

$$= \begin{cases} 0 & \text{if funding/support was applied for and was denied * in 2019/2020 and 2021} \\ 1 & \text{if funding/support was applied for and was granted in 2019/2020 and 2021} \end{cases}$$

\* Discrimination is conditional to the comparison between female and male entrepreneurs.

Both models are estimated according to the general equation for the explained variable Y:

$$E(Y = 1/X_{ikj}) = P_{ikj} = \sum_j \alpha_j X_{ikj} + \sum_j \beta_j W_{ikj} + \sum_j \phi_j Z_{ikj} + \sum_j \beta_j V_{ikj} + \sum_j \mu_j R_{ikj} + \varepsilon_j$$

Wherein explanatory variables are the following: X<sub>j</sub>= characteristics of the business; W<sub>j</sub> = characteristics of the owner or manager; Z<sub>j</sub>= characteristics of the funding; V<sub>j</sub>= activity of the business; R<sub>j</sub>=Control variables, and ε<sub>j</sub>is the error term.

Source: Authors.

**3. Outcomes from econometric analysis**

**3.1. Self-selection vis-à-vis banking loans prior the COVID-19 pandemic**

We estimate the probability of self-selection affecting entrepreneurs before the COVID-19 pandemic upon a subset of MEs that did not apply for a bank loan belonging to the two sub-samples.

**3.1.1. The WBES sub-sample**

Table 1 reports the results of the estimation of self-selection according to the characteristics of MEs, their owner and the financing of their activity in the WBES sub-sample (1.279 firms)

Female entrepreneurship is measured by the ownership of the company (*Gender ownership*).

*Gender ownership* is not significant: being a female or a male owner has no impact on the likelihood of self-selection.

*Personal loan* and *Financial inclusion* are significant and negative in all Models.

The likelihood of self-selection declines when the business uses *Personal loan* and is holding a bank account. Thus, the company is more confident that it is solvent and that its loan application may turn out to be successful.

*Financial inclusion* exerts a negative impact on the likelihood of self-selection *vis-à-vis* loan application.

*Sales Turnover* variable remains significant (Model 1b and 2b) and reduces the likelihood of self-selection, which is consistent with conventional financial theory (Brealey et al 2023).

**Table 1. Estimation of the self-selection model (marginal effects) prior the pandemic: The WBES sub-sample**

Models± Variables	(1a) Self- selection	(2a) Self- selection	(1b) Self- selection	(2b) Self- selection
<b>Personal loan</b>	-0.2169***	-0.2592***	-0.1931***	-0.2359***
(ref.: <i>No personal loan</i> )	(-6.2632)	(-8.2896)	(-5.4405)	(-7.3635)
<b>Industry: Manufacturing</b>	0.0039	0.0061	-0.0220	-0.0220
(ref.: <i>Retail and services</i> )	(0.1157)	(0.1861)	(-0.5870)	(-0.5997)
<b>Age: Mature</b>	0.0420		0.0434	
(ref.: <i>Start-up + Young</i> )	(1.0384)		(1.1014)	
<b>Ownership: Sole proprietorship</b>	-0.0125		0.0290	
(ref.: <i>Shareholding</i> )	(-0.2057)		(0.4668)	
<b>Ownership: Partnership</b>	0.0474		0.0699	
(ref.: <i>Shareholding</i> )	(0.7065)		(1.0170)	
<b>Financial inclusion</b>	-0.0886**	-0.0741**	-0.0759**	-0.0663*
(ref.: <i>Excluded</i> )	(-2.4668)	(-2.1317)	(-2.0605)	(-1.8702)
<b>Gender ownership: Female</b>	0.0020	-0.0099	0.0491	0.0196
(ref.: <i>Male</i> )	(0.0390)	(-0.2088)	(0.9240)	(0.4119)
<b>Sales Turnover</b>	-0.0158*	-0.0170**	-0.0247***	-0.0233***
	(-1.9213)	(-2.1986)	(-2.8985)	(-2.9489)
<b>Country: Egypt</b>			0.1939***	0.1871***
(ref.: <i>Jordan</i> )			(4.1768)	(4.0148)
<b>Country: Morocco</b>			0.1919***	0.1567***
(ref.: <i>Jordan</i> )			(3.6386)	(3.1027)
<b>Country: Tunisia</b>			0.1613***	0.1536***
(ref.: <i>Jordan</i> )			(2.7091)	(2.7551)
Observations	486	511	486	511
Log Likelihood	-195.05847	-205.41161	-184.2476	-195.80523
LR statistic	49.83	69.59	63.56	81.20
Mc Fadden R2	0.1157	0.1474	0.1647	0.1872
Predicted cases	84.57%	84.34%	83.13%	84.15%

Notes: Robust z-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1., ± N= 1.279 No demand out of 1.430 businesses. 1a: Model with the available variables in the WBES sub-sample. 1b: Model with the same explanatory variables as in the ERF sub-sample. Model 2a and 2b: Models 1a and 1b with control variables (Country dummies). Source: Authors from WBES (2020).

The addition of *Country dummies*, which are all significant and positive, suggests that there is a probability of self-selection in all North African countries (*Egypt, Morocco* and *Tunisia*).

### 3.1.2. The ERF sub-sample

In Table 2, we estimate self-selection upon the ERF sub-sample (1,272 firms).

Hereafter, female entrepreneurship is also measured by *Gender ownership*, which exerts no significant influence upon self-selection.

*Location of residence* proves significant and negative (Model 2a), running opposite to self-selection. Businesses located in rural areas may be prone to apply for a loan, despite they experience more difficult an access to credit due to a lack in infrastructure or higher transaction costs.

*Financial inclusion* and *Industry* are positive and significant (Model 1a and 2a). *Sales Turnover* is also positive and significant. Hence, there is self-selection.

**Table 2. Estimation of the self-selection model prior the pandemic (marginal effects): The ERF sub-sample**

Models± Variables	(1a) Self- selection	(2a) Self- selection	(1b) Self- selection	(2b) Self- selection
<b>Personal loan</b> (ref.: No personal loan)	-0.0189 (-0.4620)	-0.0200 (-0.4931)	0.0141 (0.3589)	0.0151 (0.3930)
<b>Industry: Manufacturing</b> (ref.: Retail and services)	0.1213*** (2.9489)	0.1337*** (3.2872)	0.1126*** (2.7982)	0.1320*** (3.3663)
<b>Financial inclusion</b> (ref.: Excluded)	0.1261*** (3.2343)	0.1158*** (2.9468)	0.1171*** (3.0854)	0.1005*** (2.6186)
<b>Gender ownership: Female</b> (ref.: Male)	-0.0091 (-0.1586)	-0.0054 (-0.0933)	-0.0073 (-0.1303)	-0.0011 (-0.0199)
<b>Sales Turnover</b>	0.0156* (1.7570)	0.0143 (1.6428)	0.0022 (0.2626)	-0.0020 (-0.2388)
<b>Education level: Primary school</b> (ref.: Tertiary)		-0.0381 (-0.7331)		-0.0768 (-1.4899)
<b>Education level: Secondary school</b> (ref.: Tertiary)		-0.0052 (-0.0959)		-0.0060 (-0.1169)
<b>Location of residence: Rural</b> (ref.: Urban)		-0.0690* (-1.7294)		-0.0937** (-2.4282)
<b>Country: Egypt</b> (ref.: Jordan)			0.0283 (0.5392)	0.0541 (1.0447)
<b>Country: Morocco</b> (ref.: Jordan)			-0.1084** (-2.4284)	-0.1129** (-2.5327)
<b>Country: Tunisia</b> (ref.: Jordan)			0.1746*** (3.1255)	0.2016*** (3.5521)
Observations	462	462	462	462
Log Likelihood	-227.1672	-225.14995	-214.02193	-209.14624
LR statistic	26.26	31.74	52.21	65.66
Mc Fadden R2	0.0485	0.0569	0.1035	0.1240
Predicted cases	78.79%	78.57%	78.57%	78.14%

Notes: Robust z-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. ±N= 1,272 No demand out of 1.979 micro-entrepreneurs. 1a: Model with the same explanatory variables as in the WBES sub-sample. 2b. Model with the available variables in ERF. 2a and 2b: Models 1a and 1b with control variables (Country dummies).

Source: Authors from ERF (OAMDI 2021b).

*Country dummies* display contrasted behaviour. *Egypt* proves non-significant, whereas *Morocco* is significant but negative and not prone to self-selection, only *Tunisia* is significant and positive, therefore prone to self-selection. *Sales Turnover* loses its significance (Model 1b and 2b).

### 3.1.3. Comparing the WBES and the ERF sub-samples prior the COVID-19 pandemic

A comparison of Models 2a and 2b in Table 1 with Models 1a and 1b in Table 2 shows that the determinants of self-selection behaviour are different according to sub-samples. In the WBES sub-sample, the availability of *Personal loans*, *Financial inclusion* and rising *Sales turnover* (Model 2b) reduce the likelihood of self-selection. Elasticities are consistent with conventional financial theory. In the ERF sub-sample, it depends positively on *Manufacturing Industry*, *Financial inclusion*, *Sales Turnover* (Model 1a) and one *Country dummy* (*Tunisia*).

The impact of *Financial inclusion*, *Sales Turnover* and *Country dummy (Morocco)* on the probability of self-selection in the ERF sub-sample is opposite to that in the WBES sub-sample, which may be explained by the sample composition.

### 3.2. Self-selection during the COVID-19 pandemic: The ERF sub-sample

The WBES data set was collected in 2019/2020, thus it does not cover government support programs implemented during the pandemic. Hereafter, we use the ERF sub-sample to estimate the probability of (936) businesses to self-select *vis-à-vis* government support programs.

**Table 3. Estimation of the self-selection model during the pandemic (marginal effects): The ERF sub-sample**

<b>Models± Variables</b>	<b>(1a) Self- selection</b>	<b>(2a) Self- selection</b>	<b>(1b) Self- selection</b>	<b>(2b) Self- selection</b>
<b>Industry:</b> <i>Manufacturing</i>	-0.0007	-0.0080	-0.0169	-0.0181
(ref.: <i>Retail and services</i> )	(-0.0195)	(-0.2164)	(-0.4835)	(-0.4834)
<b>Financial inclusion</b>	0.0516*	0.0594*	0.0467	0.0540
(ref.: <i>Excluded</i> )	(1.6540)	(1.8180)	(1.4685)	(1.6322)
<b>Gender ownership:</b> <i>Female</i>	-0.0137	0.0235	-0.0163	0.0201
(ref.: <i>Male</i> )	(-0.3179)	(0.5192)	(-0.3768)	(0.4409)
<b>Education level:</b> <i>Primary school</i>		-0.0306		-0.0226
(ref.: <i>Tertiary</i> )		(-0.6708)		(-0.4959)
<b>Education level:</b> <i>Secondary school</i>		0.0174		0.0015
(ref.: <i>Tertiary</i> )		(0.3727)		(0.0326)
<b>Location of residence:</b> <i>Rural</i>		0.0753*		0.0681*
(ref.: <i>Urban</i> )		(1.9137)		(1.6610)
<b>Business model adjustment</b>		0.0082		0.0042
(ref.: <i>No adjustment</i> )		(0.2447)		(0.1230)
<b>Revenue change:</b> <i>Decrease</i>		-0.0500		-0.0510
(ref.: <i>Constant</i> )		(-0.9401)		(-0.9624)
<b>Revenue change:</b> <i>Increase</i>		-0.1624*		-0.1571*
(ref.: <i>Constant</i> )		(-1.8618)		(-1.8448)
<b>Current status:</b> <i>Temporarily closed</i>		-0.0559		-0.0628
(ref.: <i>Open</i> )		(-1.3777)		(-1.5456)
<b>Current status:</b> <i>Permanently closed</i>		-0.0550		-0.0632
(ref.: <i>Open</i> )		(-0.7809)		(-0.8899)
<b>Country:</b> <i>Egypt</i>			0.0144	-0.0059
(ref.: <i>Jordan</i> )			(0.3210)	(-0.1238)
<b>Country:</b> <i>Morocco</i>			0.0038	0.0233
(ref.: <i>Jordan</i> )			(0.0718)	(0.3857)
<b>Country:</b> <i>Tunisia</i>			-0.0995***	-0.0925**
(ref.: <i>Jordan</i> )			(-2.6204)	(-2.2477)
Observations	922	840	922	840
Log Likelihood	-594.46336	-534.44094	-589.70028	-531.14737
LR statistic	2.83	12.91	12.34	19.35
Mc Fadden R2	0.0024	0.0127	0.0104	0.0188
Predicted cases	65.18%	65.83%	65.18%	67.02%

Notes: Robust z-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. ± N= 936 No demand out of 1,979 micro-entrepreneurs. 1a: Model with the same explanatory variables as in the WBES sub-sample (except *Personal loan*). 2b. Model with the available variables in the ERF sub-sample. 2a and 2b: Models 1a and 1b with control variables (Country dummies)

Source: Authors from ERF (OAMDI 2021b).

In Table 3, estimation results from Model 1 show that the factors influencing self-selection towards government support programs are different from those affecting loan demand in the

pre-COVID-19 period (See Model 1 in Table 2), using the same explanatory variables, *Personal loan* being excepted.

*Gender ownership* is non-significant, whatever the Model: Female micro-entrepreneurs are not prone to self-selection *vis-à-vis* government programs.

*Financial inclusion* is positive as before the COVID-19 outbreak, although it is only significant in Model 1a and 2a. It exerts no robust effect on the probability of self-selection behaviour.

The addition of other variables does not improve the results. *Rural* businesses prove more prone to self-selection, whereas a rising *revenue* runs opposite to self-selection. *Country dummies* are non-significant, with the exception of *Tunisia* that is negative.

### 3.3. Discrimination regarding banking loans prior COVID-19: The WBES sub-sample

Noteworthy is that this estimation upon the ERF sub-sample proved impossible because there is no information on the decision of credit application.

**Table 4. Estimation of the discrimination model prior the pandemic (marginal effects): The WBES sub-sample**

Models±	(1a)	(2a)	(1b)	(2b)
Variables	discrimination	discrimination	discrimination	discrimination
<b>Industry: Manufacturing</b>	-0.0579	-0.0034	-0.0398	-0.0299
(ref.: Retail and services)	(-0.6799)	(-0.0437)	(-0.4340)	(-0.3477)
<b>Age: Mature</b>	0.1389		0.1327	
(ref.: Start-up + Young)	(1.2501)		(1.0094)	
<b>Ownership: Sole proprietorship</b>	1.0250***		1.0623***	
(ref.: Shareholding)	(5.1933)		(4.9596)	
<b>Ownership: Partnership</b>	1.0680***		1.1160***	
(ref.: Shareholding)	(5.1706)		(4.7944)	
<b>Financial inclusion</b>	-0.2028**	-0.1840**	-0.2059**	-0.1630**
(ref.: Excluded)	(-2.4562)	(-2.3898)	(-2.3216)	(-2.1005)
<b>Gender ownership: Female</b>	-0.0558	-0.0811	-0.0655	-0.0560
(ref.: Male)	(-0.5606)	(-0.8128)	(-0.6551)	(-0.5623)
<b>Sales Turnover</b>	-0.0201	-0.0186	-0.0149	-0.0042
	(-1.0243)	(-0.9849)	(-0.8424)	(-0.2386)
<b>Country: Egypt</b>			-0.0762	-0.0550
(ref.: Jordan)			(-0.6935)	(-0.5387)
<b>Country: Morocco</b>			-0.0721	-0.1735*
(ref.: Jordan)			(-0.5733)	(-1.8457)
<b>Country: Tunisia</b>			0.0214	-0.0620
(ref.: Jordan)			(0.1662)	(-0.5677)
Observations	80	90	80	90
Log Likelihood	-33.738075	-37.260228	-33.300443	-36.164062
LR statistic	527.33	8.29	548.19	9.78
Mc Fadden R2	0.1261	0.0811	0.1374	0.1082
Predicted cases	80.00%	83.33%	81.25%	83.33%

Notes: Robust z-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1., ± N= 103 demand out of 1,430 businesses. 1a. Model with the available variables in ERF. 2a: Model with the same explanatory variables as in the WBES sub-sample. 2a and 2b: Models 1a and 1b with control variables (Country dummies).

Source: Authors from WBES (2020).

Table 4 reports the estimated probability of credit rejection by financial institutions before the outbreak of the pandemic upon a subset of 103 WBES businesses that applied for a bank loan.

Being a female or a male owner has no impact on the likelihood of rejection. Hence, there is no gender discrimination in loan granting decisions from financial institutions.

The rejection rates of credit applicants are positively determined by *Ownership* (*Sole proprietorship* and *Partnership*) compared to *Shareholding* companies. It is negatively determined by *Financial inclusion*, an indicator of business solvency affecting the decision of banks to grant credit. This is consistent with conventional financial theory (Brealey et al 2023). *Country dummy* (*Morocco*) is significant but negative.

### 3.4. Discrimination regarding support programs during COVID-19: The ERF sub-sample.

We could not use the WBES because data were only available for Jordan and Morocco. Hereafter, we use the ERF sub-sample (332 micro-entrepreneurs). Table 5 reports estimation results.

**Table 5. Estimation of the discrimination model during the pandemic (marginal effects): The ERF sample**

Models±	(1a)	(2a)	(1b)	(2b)
Variables	Discrimination	Discrimination	Discrimination	Discrimination
<b>Industry: Manufacturing</b>	0.0502	0.0384	0.0653	0.0511
(ref.: Retail and services)	(0.8347)	(0.5955)	(1.0859)	(0.7944)
<b>Financial inclusion</b>	-0.0086	-0.0154	-0.0039	-0.0165
(ref.: Excluded)	(-0.1567)	(-0.2664)	(-0.0724)	(-0.2854)
<b>Gender ownership: Female</b>	0.1030	0.0920	0.0983	0.0968
(ref.: Male)	(1.3927)	(1.1893)	(1.3482)	(1.2517)
<b>Education level: Primary school</b>		0.1076		0.1012
(ref.: Tertiary)		(1.3397)		(1.2509)
<b>Education level: Secondary school</b>		0.0209		0.0346
(ref.: Tertiary)		(0.2466)		(0.4032)
<b>Location of residence: Rural</b>		-0.0575		-0.0203
(ref.: Urban)		(-0.8057)		(-0.2796)
<b>Revenue change: Decrease</b>		0.0287		0.0422
(ref.: Constant)		(0.2899)		(0.4422)
<b>Revenue change: Increase</b>		0.0004		-0.0132
(ref.: Constant)		(0.0029)		(-0.0882)
<b>Current status: Temporarily closed</b>		-0.0599		-0.0521
(ref.: Open)		(-0.8630)		(-0.7586)
<b>Current status: Permanently closed</b>		-0.0352		-0.0833
(ref.: Open)		(-0.2903)		(-0.6708)
<b>Business model adjustment</b>		-0.1039*		-0.1048*
(ref.: No adjustment)		(-1.8485)		(-1.8535)
<b>Country: Egypt</b>			-0.0689	-0.0755
(ref.: Jordan)			(-0.8292)	(-0.8570)
<b>Country: Morocco</b>			0.2163**	0.2009*
(ref.: Jordan)			(2.4213)	(1.9229)
<b>Country: Tunisia</b>			0.0756	0.0794
(ref.: Jordan)			(1.1893)	(1.1568)
Observations	321	290	321	290
Observations	321	290	321	290
Log Likelihood	-215.1209	-190.02657	-210.60894	0.0415
LR statistic	2.31	8.99	10.97	15.18
Mc Fadden R2	0.0053	0.0243	0.0262	0.0415
Predicted cases	60.44%	63.10%	61.68%	65.52%

Notes: Robust z-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. ± N= 332 demand out of 1,979 micro-entrepreneurs. 1a: Model with the same explanatory variables as in the WBES sub-sample (prior the pandemic).



2b. Model with the available variables in ERF. 2a and 2b: Models 1a and 1b with control variables (Country dummies).

*Source:* Authors from ERF (OAMDI2021b).

Model 1a shows that the determinants of the likelihood of rejection by government support programs during the pandemic are different from those by financial institutions in the pre-COVID-19 period (See Model 2a in Table 4), using the same explanatory variables.

*Financial inclusion* does not affect the decision to grant support by government programs during COVID-19 (Model 1a in Table 5), in contrast with the decision of financial institutions to grant credit by before COVID-19 (Model 2a in Table 4), which *Financial inclusion* did affect positively. The decision to assist businesses with government programs is not conditional to bank account holding.

This result is consistent with the absence of discrimination on the credit market in North Africa (Morsy et al 2019; Berguiga & Adair 2021) and the Middle East and North Africa countries (Berguiga & Adair 2022).

*Business adjustment* is negative and significant: when enterprises adjust their business model and when they use financial technology (*fintech*). The use of the smartphone for marketing and placing orders, of the Internet, of online social media, and of specialised applications or digital platforms reduces the rejection decisions for government support programs.

The introduction of *Country dummies* (Models 1b and 2b) brings in no additional effect. *Morocco* wherein there is a probability of discrimination against micro-entrepreneurs stands as an exception.

## **4. Conclusion and policy recommendations**

### **4.1. Conclusions**

We use two pooled sub-samples of microenterprises (1-9 employees) from the WBES and the ERF databases. We address (female) micro-entrepreneurs' self-selection (i) prior and (ii) during the COVID-19 pandemic, as well as discrimination against (female) micro-entrepreneurs (iii) prior and (iv) during the pandemic in four MENA countries (*Egypt, Jordan, Morocco and Tunisia*).

Prior the pandemic, there is no evidence of gender self-selection *vis-à-vis* loan application. Tunisian micro-entrepreneurs are prone to self-selection *vis-à-vis* loan application (ERF), whereas microenterprises are prone to self-selection in all countries from North Africa (WBES). During the pandemic, there is no evidence of self-selection *vis-à-vis* government support affecting either gender or micro-entrepreneurs. During the pandemic, female entrepreneurs' self-selection *vis-à-vis* government support proves non-robust according to the ERF sub-sample.

Prior the pandemic, and with respect to loan application, females or micro-entrepreneurs do not face discrimination according to the WBES sub-sample. During the pandemic and with respect to government funding support, there is no discrimination against females, whereas Moroccan micro-entrepreneurs are subject to discrimination according to the ERF sub-sample.

By and large, our findings are consistent with previous results from MENA countries, prior the COVID-19 outbreak (Morsy et al 2019; Berguiga & Adair 2021) as regards gender self-selection. They do also match, in as much as there is no evidence of gender discrimination. However, a caveat applies: both sub-samples are non-representative, due a selection bias that do not offset one another.

Prior the pandemic, financial inclusion runs opposite to both self-selection and discrimination (WBES), but not for self-selection (ERF). It proves insignificant during the pandemic with respect to self-selection or discrimination, whatever the sub-sample. Therefore, financial inclusion cannot stand in the way of self-selection or discrimination, remaining major drawbacks to the growth of micro-businesses, which enhanced funding policies should address. In as much as micro-entrepreneurs do not necessarily access the loan or benefit the support they expect, policies must bring in conducive conditions and foster stakeholders to overcome (gender) self-selection and discrimination. Herein lies the role of the microfinance industry.

## **4.2. Policy implications and recommendations**

### **4.2.1. Policy implications: spreading the use of *fintech* and collecting robust data**

In the wake of COVID-19 and to various extent, authorities from the four MENA countries have adapted access to and use of banking services, implementing mechanisms to foster remote transactions and payments, providing new opportunities for the use of *fintech* (Ayadi et al 2021). Spreading means of payment is one lever for alleviating inequalities regarding account holding, yet it will not close the gender gap and boost lagging micro-enterprise. Hence, funding from financial institutions needs enhancement.

In this respect Sustainable Development Goal 5 — “achieve gender equality and empower all women and girls” — requires financial services that are affordable, accessible, and easy to use and tailored to meet females’ needs. Many service offerings do not comply with aforementioned conditions, although a wide range of e-banking services are available: free issuance of bankcards, digital payment of social assistance, removing fees on ATM withdrawals and electronic payments, etc. Such services require to enhancing financial, business, and digital literacy.

Empirical work dedicated to financial inclusion differentials is rather scarce in the four countries. Financial inclusion strategies and policies fail to consider women's perspectives and needs, and this is due in the first place to a lack of gender-disaggregated data necessary to inform policy (G20 GPMI 2020). According to SME Finance Forum (2020), little if any data is available at country level on financing female entrepreneurs, young entrepreneurs or other key actors targeted for promoting financial inclusion. Data collected by international financial institutions and specialised development banks supporting the private sector remain uncoordinated, inconsistent and do not match with national SME definitions and reporting requirements to financial sector regulators. Harmonised robust data collection is an important issue in this respect.

#### **4.2.2. Funding enhancement and the role of the microfinance industry**

Policies should foster funding enhancement by financial institutions and the government, such as extending the guarantee scheme for borrowers, regulating crowdfunding platforms, wherein microfinance institutions (MFIs) act as loan brokers, and promoting positive discrimination towards female entrepreneurs, whereby the microfinance industry is key. There is a rising number of borrowers from MFIs, alongside that of loan accounts with MFIs and branches over 2017-2020. Although not a panacea, MFIs are major stakeholders that provide small loans to female entrepreneurs and micro-enterprises (Adair 2022).

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## Appendix

**Table A1. Financial Inclusion in MENA Countries: Key Data (Series and percentage)**

Country Year	Egypt		Jordan		Morocco		Tunisia	
	2017	2021	2017	2020	2017	2020	2017	2020
Account in any financial institution or mobile money service (population aged 15+)	32	26	42	43	28	42	37	36
Account in any financial institution (or mobile money service), female (aged 15+)	27	23	27	32	17	31	28	29
Account in any financial institution (or mobile money service), male (aged 15+)	(1)	(2)	(0)	(6)	(0)	(4)	(2)	(2)
Borrowed from a formal financial institution (population aged 15+)	37	29	56	53	41	53	46	43
Borrowed from a formal financial institution, female (aged 15+)	(3)	(4)	(2)	(15)	(1)	(8)	(2)	(5)
Borrowed from a formal financial institution, male (aged 15+)	9	7	18	10	3	5	12	10
Borrowed from family or friends (population aged 15+)	6	5	14	6	2	4	7	9
Borrowed from family or friends, female (% aged 15+)	11	10	21	13	4	6	16	11
Borrowed from family or friends, male (% aged 15+)	38	38	31	42	18	49	32	41
Borrowed to start, operate, or expand a (farm or business), female (aged 15+)	36	39	32	38	17	46	26	39
Borrowed to start, operate, or expand a (farm or business), male (aged 15+)	40	37	30	45	19	51	38	44
Experience or continue to experience severe financial hardship as a result of the disruption caused by COVID-19: very worried, female (aged 15+)	2		3		1		3	..
Experience or continue to experience severe financial hardship as a result of the disruption caused by COVID-19: very worried, male (% age 15+)	5		5		2		9	..
Experience or continue to experience severe financial hardship as a result of the disruption caused by COVID-19: very worried, female (aged 15+)		52		61		55		33
Experience or continue to experience severe financial hardship as a result of the disruption caused by COVID-19: very worried, male (% age 15+)		48		59		41		36
Has an inactive account, female (aged 15+)	4	4	2	5	4	6	2	4
Has an inactive account, male (aged 15+)	3	3	5	7	5	10	2	4
Made or received a digital payment (population aged 15+)	23	20	33	36	17	30	29	28
Made or received a digital payment, female (aged 15+)	17	16	20	24	8	21	21	21
Made or received a digital payment, male (% age 15+)	29	24	43	47	26	39	38	34

Source: Global Findex Database (2021) Egypt, Jordan, Morocco and Tunisia

**Table A2. Financial Access Survey –FAS Country Survey Data: MENA Countries**

Country Year	Egypt		Jordan		Morocco		Tunisia	
	2017	2021	2017	2020	2017	2020	2017	2020
Number of borrowers from MFIs per 1,000 adults	35.44	50.66	66.85	58.85			40.27	49.98
Number of borrowers from commercial banks per 1,000 adults	103.53	119.49					234.18	245.98
Number of SME borrowers from commercial banks (% of non-financial corporation borrowers)							17.82	17.36
Number of MFIs branches per 100,000 adults	2.60	6.07	3.22	3.11		5.95	1.51	2.13
Number of commercial bank branches per 100,000 adults	4.88	6.79	14.42	13.87	24.85	22.15	21.70	22.32
Number of loan accounts with MFIs per 1,000 adults	35.44	50.66	58.78	46.12			43.23	51.85
Outstanding deposits with commercial banks (% of GDP)	95.51	101.45	112.92	123.03	84.80	88.50	61.50	68.79
Outstanding loans from commercial banks to household sector (% of GDP)	7.48	9.73	35.99	38.22	25.68	25.92	22.27	21.29
Outstanding SME loans from commercial banks (% of GDP)			7.13	6.43	14.02	15.64	21.86	19.68

Source: IMF <https://data.imf.org/regular.aspx?key=61063966> Egypt, Jordan, Morocco and Tunisia.

**Table A3. Dictionary of variables: WBES and ERF sub-samples**

	<b>Name</b>	<b>Type</b>	<b>Definition</b>	<b>Units</b>	<b>Source 1</b>	<b>Source 2</b>
<b>Characteristics of the owner</b>	<i>Gender ownership</i>	Discrete	<i>Female = 1</i> <i>Male = 2</i>	Binary (1, 2)	WBES <i>Calculated</i>	ERF
	<i>Education level</i>	Discrete	<i>Primary school = 1</i> <i>Secondary school=2</i> <i>Tertiary (University)=3</i>	Ordinal (1, 2, 3)		ERF <i>Calculated</i>
	<b>Characteristics of the firm</b>	<i>Industry</i>	Discrete	<i>Manufacturing = 1</i> <i>Retail and services = 2</i>	Binary (1, 2)	WBES <i>Calculated</i>
	<i>Size</i>	Discrete	Full-time permanent staff <i>Micro: 1-9 employees = 1</i>	Ordinal (1)	WBES <i>Calculated</i>	ERF <i>Calculated</i>
	<i>Age</i>	Discrete	Number of years <i>Start-up + young &lt;8 years = 1</i> <i>Mature &gt;=8 years = 2</i>	Binary (1, 2)	WBES <i>Calculated</i>	
	<i>Ownership</i>	Discrete	<i>Sole proprietorship = 1</i> <i>Partnership = 2</i> <i>Shareholding = 3</i>	Ordinal (1, 2, 3)	WBES <i>Calculated</i>	
	<i>Financial inclusion</i>	Discrete	<i>Excluded (no bank account) = 0</i> <i>Included (bank account) = 1</i>	Dummy (0,1)	WBES	ERF <i>Calculated</i>
	<i>Local of residence</i>	Discrete	<i>Rural= 1</i> <i>Urban = 2</i>	Binary (1, 2)		ERF
<b>Funding of the firm</b>	<i>Personal loans</i>	Discrete	<i>No personal loans =0</i> <i>Personal loans funding busines. activities =1</i>	Dummy (0, 1)	WBES	ERF <i>Calculated</i>
	<i>Self-selection prior COVID-19</i>	Discrete	<i>Need and no loan demand before COVID-19=0</i> <i>Need and loan demand before COVID-19=1</i>	Dummy (0, 1)	WBES <i>Calculated</i>	ERF <i>Calculated</i>
	<i>Self-selection during COVID-19</i>	Discrete	<i>Need and no demand for support during COVID-19=0</i> <i>Need and demand for support during COVID-19=1</i>	Dummy (0, 1)	WBES <i>Calculated</i>	ERF <i>Calculated</i>
	<i>Discrimination during COVID-19</i>	Discrete	<i>Rejected =0</i> <i>Granted =1</i>	Dummy (0, 1)	WBES <i>Calculated</i>	ERF <i>Calculated</i>
<b>Activity of the firm</b>	<i>Sales Turnover</i>	Continuous	<i>Ln(Sales turnover) as of 2019</i>	Currency unit	WBES <i>Calculated</i>	ERF <i>Calculated</i>
	<i>Revenue change (compared to 2019)</i>	Discrete	<i>Decrease=1</i> <i>Increase=2</i> <i>Constant=3</i>	Ordinal (1, 2, 3)		ERF <i>Calculated</i>
	<i>Current status</i>	Discrete	<i>Temporarily closed=1</i> <i>Permanently closed =2</i> <i>Open=3</i>	Ordinal (1, 2, 3)		ERF <i>Calculated</i>
	<i>Business model adjustment</i>	Discrete	<i>No=0</i> <i>Yes=1</i>	Dummy (0, 1)		ERF <i>Calculated</i>
<b>Control variables</b>	<i>Country dummies</i>	Discrete	<i>Egypt=1</i> <i>Morocco=2</i> <i>Tunisia=3</i> <i>Jordan=4</i>	Ordinal (1, 2, 3,4)	WBES	ERF

Source: Authors from World Bank Enterprises Survey (WBES 2020) and OADMI (ERF 2021)



**Table A4. Descriptive statistics according to gender: WBES and ERF sub-samples**

		Gender ownership (WBES) $\pm$					Gender ownership (ERF) $\pm\pm$				
		Female	%	Male	%	Total	Female	%	Male	%	Total
<b>Country</b>	<i>Egypt</i>	45	5.25	812	94.75	857	30	7.92	349	92.08	379
	<i>Morocco</i>	27	12.05	197	87.95	224	82	10.53	697	89.47	779
	<i>Tunisia</i>	32	27.12	86	72.88	118	96	20.82	365	79.18	461
	<i>Jordan</i>	43	18.61	188	81.39	231	37	10.28	323	89.72	360
	Total	147	10.28	1,283	89.72	1,430	245	12.38	1,734	87.62	1,979
<b>Industry</b>	<i>Manufacturing</i>	59	7.66	711	92.34	770	43	7.61	522	92.39	565
	<i>Retail &amp; services</i>	88	13.33	572	86.67	660	201	15.08	1,132	84.92	1,333
	Total	147	10.28	1,283	89.72	1,430	244	12.86	1,654	87.14	1,898
<b>Size</b>	<i>Micro</i>	147	10.28	1,283	89.72	1,430	245	12.37	1,734	87.62	1,979
	<i>Excluded</i>	36	6.79	494	93.21	530	133	12.61	922	87.39	1,055
<b>Financial inclusion</b>	<i>Included</i>	110	12.46	773	87.54	883	112	12.12	812	87.88	924
	Total	146	10.33	1,267	89.67	1,413	245	12.38	1,734	87.62	1,979
<b>Loan demand (prior COVID)</b>	<i>No Demand</i>	124	9.70	1,155	90.30	1,279	149	11.71	1,123	88.29	1,272
	<i>Demand</i>	16	15.53	87	84.47	103	44	14.67	256	85.33	300
	Total	140	10.13	1,242	89.87	1,382	193	12.28	1,379	87.72	1,572
<b>Loan outcome application* (prior COVID)</b>	<i>Rejected</i>	2	13.33	13	86.67	15					
	<i>Granted</i>	14	17.28	67	82.72	81					
	Total	16	16.67	80	83.33	96					
<b>Personal loan</b>	<i>No personal loan</i>	113	9.07	1,133	90.93	1,246	124	10.94	1,009	89.06	1,133
	<i>Personal loan</i>	24	20.34	94	79.66	118	121	14.30	725	85.70	846
	Total	137	10.04	1,227	89.96	1,364	245	12.38	1,734	87.62	1,979
<b>Self-selection (prior COVID)</b>	<i>No</i>	16	15.53	87	84.47	103	44	14.67	256	85.33	300
	<i>Yes</i>	50	11.39	389	88.61	439**	149	11.71	1,123	88.29	1,272
	Total	66	12.18	476	87.82	542	193	12.28	1,379	87.72	1,572
Total		147	10.28	1,283	89.72	1,430	245	12.38	1,734	87.62	1,979

Notes:  $\pm$  N= 1,430.  $\pm\pm$  N = 1,979.\*Loan application outcome prior COVID-19 is available only for the WBES sample and N/A=7. \*\*For WBES, N/A =840 missing observations. Among 1,279 firms not applying for a loan, data are available only for 439 self-selecting firms. Source: WBES (2020) and ERF (2021).

**Table A5. Estimations without and with country dummies**

Prior COVID-19							
WBES		ERF		WBES		ERF	
No self-selection as for gender but it affects all countries		Self-selection affects Tunisia		No discrimination		Discrimination	
Female ownership	NS	Female ownership	NS	Female ownership	NS	No data	
Financial inclusion	-	Financial inclusion	+	Financial inclusion	-		
Sales Turnover	-	Sales Turnover	+ / NS				
<i>Egypt</i>	+	<i>Egypt</i>	NS	<i>Egypt</i>	NS		
<i>Morocco</i>	+	<i>Morocco</i>	-	<i>Morocco</i>	-		
<i>Tunisia</i>	+	<i>Tunisia</i>	+	<i>Tunisia</i>	NS		
During COVID-19							
WBES		ERF		WBES		ERF	
Self-selection		No self-selection		Discrimination		No discrimination as for gender but it affects Morocco	
Not enough data (available data only for Jordan and Morocco)		Female ownership	NS	Not enough data (available data only for Jordan and Morocco)		Female ownership	NS
		Financial inclusion	+ / NS			Financial inclusion	NS
		<i>Egypt</i>	NS			<i>Egypt</i>	NS
		<i>Morocco</i>	NS			<i>Morocco</i>	+
		<i>Tunisia</i>	-			<i>Tunisia</i>	NS

Note: NS= non significant. Country dummies in Italics.

Source: Authors