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# WORKING PAPER

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

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**Abstract**

*Factors detrimental to financial inclusion (account holding and borrowing) regarding female entrepreneurs arise 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 to 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 from the 2020 World Bank Enterprise Survey (WBES) and the Economic Research Forum (ERF) COVID-19 Monitor in 2021.*

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*We address (female) micro-entrepreneur self-selection (i) prior to and (ii) during the COVID-19 pandemic, as well as discrimination (iii) prior to 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 to the pandemic, females or micro-entrepreneurs do not face discrimination in loan applications (WBES). During the pandemic, females are not subject to discrimination as a result of government support, whereas Moroccan micro-entrepreneurs do face discrimination (ERF).*

*Prior to 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 the business growth of micro-entrepreneurs, that policies enhancing funding should help overcome.*

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

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

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*The usual disclaimer applies.*

# Introduction

# 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 usage does not occur on the entrepreneur demand-side, due to the absence of a 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 an 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) account for only 16% of total requests, whilst there is less 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 it stimulates the local economy. This is a major issue in MENA countries, where the unemployment rate is high - especially amongst the young - 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. They also 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, driving self-selection. This is a controversial hypothesis that may depend on job position datasets and countries, which proves plausible amongst MENA countries.

GEM provides a household survey of 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 amongst the top 20 countries from 1975-2018. Aljuwaiber (2021) selected a data set of 271 articles on entrepreneurship in MENA countries from 2009-2019. "Female entrepreneurship and gender" was the dominant topic, with 69 papers, amongst which only eight 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 in 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 collateral, exactly the same lending conditions they require from men. Discrimination occurs if female entrepreneurs with the same characteristics as their male counterparts are denied a loan when they apply for one.

On the one hand, for developing countries, there is no discrimination affecting female entrepreneurs. 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 one; c) those that need a loan and apply for one. 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 from 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, the 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 enjoying 10 years of experience, 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 between 4% and 10% in Morocco and Tunisia. As for access to financing, the difficulty of being a female entrepreneur, compared with 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 for 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 as follows: 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 5 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 5 employees), Small (6-49), Medium-size (50-199) and Large (over 200 employees).

Bearing in mind that microenterprises are the most widespread category of business, 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 they are not always representative and cannot be pooled, because they do not include the same characteristics (e.g., gender).

World Bank Enterprise Surveys (WBES 2020), conducted in 2019, provide a pooled sub-sample of 1,430 microenterprises (MEs) in Tunisia, Morocco, Jordan and Egypt. WBES are biased by the prominent manufacturing industry (over half the firms), the 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 quite large account holding (over three out of five companies own a bank account) but little use of bank loans (less than one in every 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 ME business owners, whose financial behaviour prior to and during the COVID-19 pandemic, including the impact of government support, was assessed. Prior to COVID-19, financial inclusion is one third lower, whereas self-selection is twice as high (almost two thirds) as in the WBES. Personal loans are widespread (over two out of every five businesses), that's 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.

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

The 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).

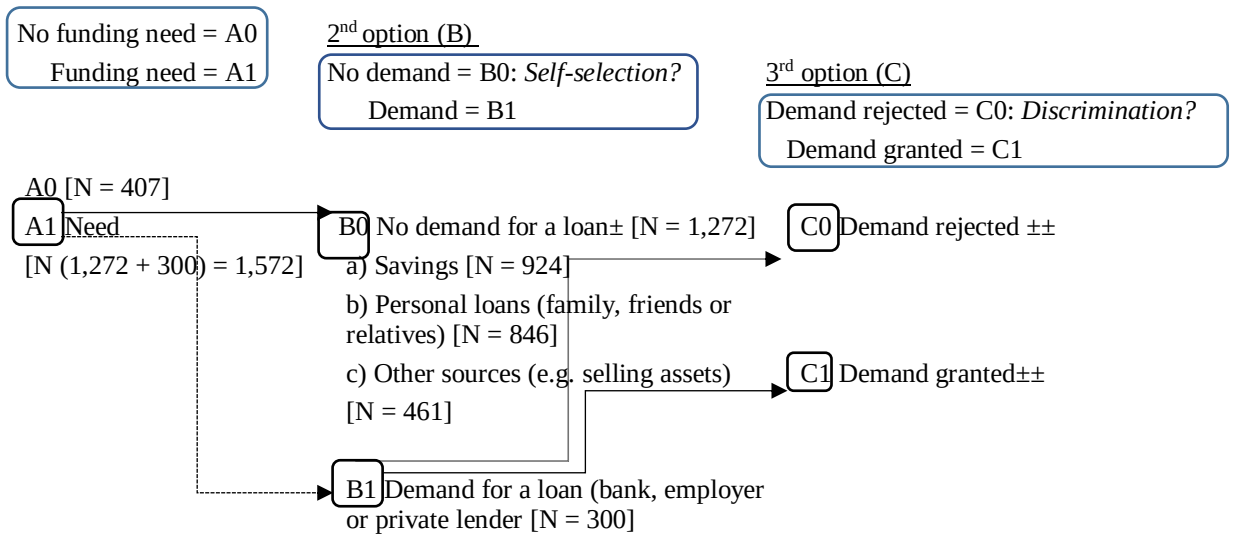
The ERF conducted three waves upon a stratified sample of enterprises (OAMDI 2021a). Unfortunately, the lack of variables, (e.g., gender ownership) precluded tackling gender differentials.

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

## 2.2 Model design

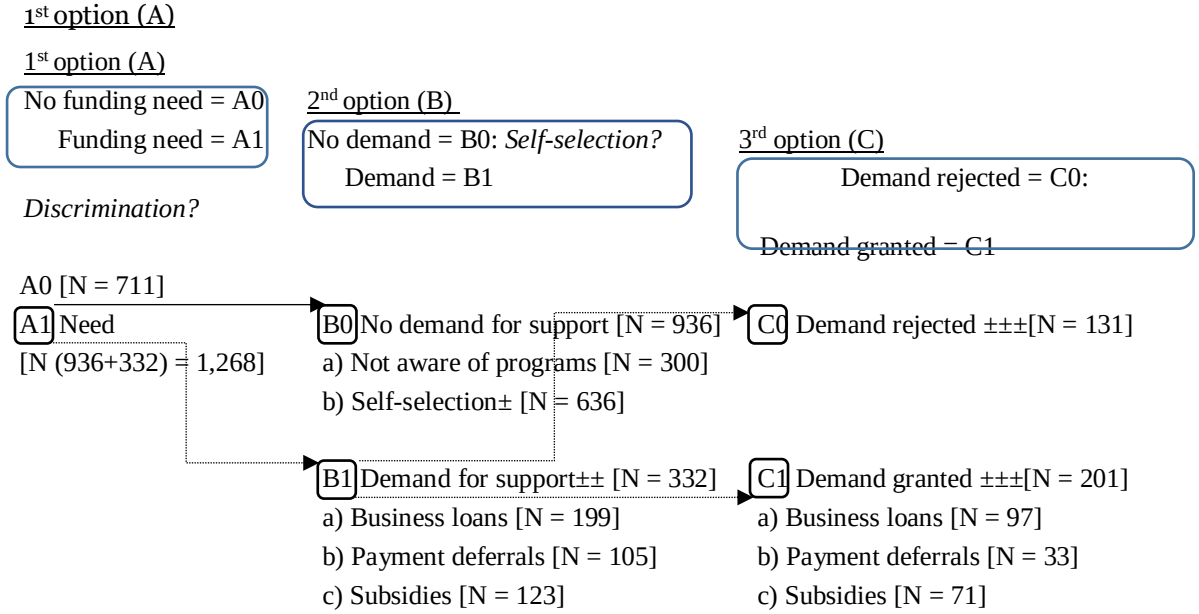
We design a sequential choice model best represented with a decision tree, which includes three binary options: (A) no funding need vs. funding need prior to (B) no funding application (self-selection) vs. funding application and (C) funding denied (potential discrimination) vs. funding granted (See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

$$\boldsymbol{Self-selection}_{ik} = \begin{cases} \mathbf{0}\ \boldsymbol{if\ funding/support\ was\ needed\ and\ not\ applied\ for\ in}\ \mathbf{2019/2020}\ \boldsymbol{and}\ \mathbf{2021} \\ \mathbf{1}\ if\ funding/support\ was\ needed\ and\ applied\ for\ in\ 2019/2020\ and\ 2021 \end{cases}$$

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

$$\boldsymbol{Discrimination}_{ik} = \begin{cases} \boldsymbol{0if\ funding/support\ was\ applied\ for\ and\ was\ denied} * \ \boldsymbol{in}\ \mathbf{2019/2020}\ \boldsymbol{and}\ \mathbf{2021} \\ 1\ if\ funding/support\ was\ applied\ for\ and\ was\ granted\ in\ 2019/2020\ \ and\ 2021 \end{cases}$$

* 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*:

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

Wherein explanatory variables are the following: $X_j$= characteristics of the business; $W_j$ = characteristics of the owner or manager; $Zj$= characteristics of the funding; $V_I$= activity of the business; $R_I$=Control variables, and $\varepsilon_j$ 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).

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

| Models± Variables | (1a) Self-selection | (2a) Self-selection | (1b) Self-selection | (2b) Self-selection |
|---|---|---|---|---|
| **Personal loan** | -0.2169*** | -0.2592*** | -0.1931*** | -0.2359*** |
| (ref.: *No personal loan)* | (-6.2632) | (-8.2896) | (-5.4405) | (-7.3635) |
| **Industry:** *Manufacturing* | 0.0039 | 0.0061 | -0.0220 | -0.0220 |
| (ref.: *Retail and services)* | (0.1157) | (0.1861) | (-0.5870) | (-0.5997) |
| **Age**: *Mature* | 0.0420 | | 0.0434 | |
| (ref.: *Start-up + Young)* | (1.0384) | | (1.1014) | |
| **Ownership**: *Sole proprietorship* | -0.0125 | | 0.0290 | |
| (ref.*: Shareholding)* | (-0.2057) | | (0.4668) | |
| **Ownership**: *Partnership* | 0.0474 | | 0.0699 | |
| (ref.*: Shareholding)* | (0.7065) | | (1.0170) | |
| **Financial inclusion** | -0.0886** | -0.0741** | -0.0759** | -0.0663* |
| (ref.: *Excluded)* | (-2.4668) | (-2.1317) | (-2.0605) | (-1.8702) |
| **Gender ownership**: *Femal* | 0.0020 | -0.0099 | 0.0491 | 0.0196 |
| (ref.: *Male)* | (0.0390) | (-0.2088) | (0.9240) | (0.4119) |
| **Sales Turnover** | -0.0158* | -0.0170** | -0.0247*** | -0.0233*** |
| | (-1.9213) | (-2.1986) | (-2.8985) | (-2.9489) |
| **Country**: *Egypt* | | | 0.1939*** | 0.1871*** |
| (ref.: *Jordan)* | | | (4.1768) | (4.0148) |
| **Country**: *Morocco* | | | 0.1919*** | 0.1567*** |
| (ref.: *Jordan)* | | | (3.6386) | (3.1027) |
| **Country**: *Tunisia* | | | 0.1613*** | 0.1536*** |
| (ref.: *Jordan)* | | | (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. Models 2a and 2b: Models 1a and 1b with control variables (Country dummies).
***Source***: Authors from WBES (2020).

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. The 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). 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).

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

| Models± Variables | (1a) Self-selection | (2a) Self-selection | (1b) Self-selection | (2b) Self-selection |
|---|---|---|---|---|
| **Personal loan** | -0.0189 | -0.0200 | 0.0141 | 0.0151 |
| (ref.: *No personal loan)* | (-0.4620) | (-0.4931) | (0.3589) | (0.3930) |
| **Industry**: *Manufacturing* | 0.1213*** | 0.1337*** | 0.1126*** | 0.1320*** |
| (ref.: *Retail and services)* | (2.9489) | (3.2872) | (2.7982) | (3.3663) |
| **Financial inclusion** | 0.1261*** | 0.1158*** | 0.1171*** | 0.1005*** |
| (ref.: *Excluded)* | (3.2343) | (2.9468) | (3.0854) | (2.6186) |
| **Gender ownership**: *Female* | -0.0091 | -0.0054 | -0.0073 | -0.0011 |
| (ref.: *Male)* | (-0.1586) | (-0.0933) | (-0.1303) | (-0.0199) |
| **Sales Turnover** | 0.0156* | 0.0143 | 0.0022 | -0.0020 |
| | (1.7570) | (1.6428) | (0.2626) | (-0.2388) |
| **Education level**: *Primary school* | | -0.0381 | | -0.0768 |
| (ref.: *Tertiary)* | | (-0.7331) | | (-1.4899) |
| **Education level:** *Secondary school* | | -0.0052 | | -0.0060 |
| (ref.: *Tertiary)* | | (-0.0959) | | (-0.1169) |
| **Location of residence**: *Rural* | | -0.0690* | | -0.0937** |
| (ref.: *Urban)* | | (-1.7294) | | (-2.4282) |
| **Country**: *Egypt* | | | 0.0283 | 0.0541 |
| (ref.: *Jordan)* | | | (0.5392) | (1.0447) |
| **Country**: *Morocco* | | | -0.1084** | -0.1129** |
| (ref.: *Jordan)* | | | (-2.4284) | (-2.5327) |
| **Country**: *Tunisia* | | | 0.1746*** | 0.2016*** |
| (ref.: *Jordan)* | | | (3.1255) | (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).

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 counter to self-selection. Businesses located in rural areas may be prone to apply for a loan, despite the fact they experience more difficulty accessing credit, due to a lack of 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.

Country dummies display contrasting behaviour. Egypt proves insignificant, 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 to 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 programmes implemented during the pandemic. Hereafter, we use the ERF sub-sample to estimate the probability of businesses (936) to self-select vis-à-vis government support programmes.

In Table 3, estimation results from Model 1 show that the factors influencing self-selection towards government support programmes 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 insignificant, whatever the Model: Female micro-entrepreneurs are not prone to self-selection vis-à-vis government programmes.

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 insignificant, with the exception of Tunisia, which is negative.

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

| Models± Variables | (1a) Self-selection | (2a) Self-selection | (1b) Self-selection | (2b) Self-selection |
|---|---|---|---|---|
| **Industry**:*Manufacturing* | -0.0007 | -0.0080 | -0.0169 | -0.0181 |
| (ref.: *Retail and services)* | (-0.0195) | (-0.2164) | (-0.4835) | (-0.4834) |
| **Financial inclusion** | 0.0516* | 0.0594* | 0.0467 | 0.0540 |
| (ref.: *Excluded)* | (1.6540) | (1.8180) | (1.4685) | (1.6322) |
| **Gender ownership**: *Female* | -0.0137 | 0.0235 | -0.0163 | 0.0201 |
| (ref.: *Male)* | (-0.3179) | (0.5192) | (-0.3768) | (0.4409) |
| **Education level**: *Primary school* | | -0.0306 | | -0.0226 |
| (ref.: *Tertiary*) | | (-0.6708) | | (-0.4959) |
| **Education level**: *Secondary school* | | 0.0174 | | 0.0015 |
| (ref.: *Tertiary*) | | (0.3727) | | (0.0326) |
| **Location of residence**: *Rural* | | 0.0753* | | 0.0681* |
| (ref.: *Urban)* | | (1.9137) | | (1.6610) |
| **Business model adjustment** | | 0.0082 | | 0.0042 |
| (ref.: *No adjustment*) | | (0.2447) | | (0.1230) |
| **Revenue change**: *Decrease* | | -0.0500 | | -0.0510 |
| (ref.*: Constant*) | | (-0.9401) | | (-0.9624) |
| **Revenue change**: *Increase* | | -0.1624* | | -0.1571* |
| (ref.*: Constant*) | | (-1.8618) | | (-1.8448) |
| **Current status**: *Temporarily closed* | | -0.0559 | | -0.0628 |
| (ref.*: Open*) | | (-1.3777) | | (-1.5456) |
| **Current status**: *Permanently closed* | | -0.0550 | | -0.0632 |
| (ref.*: Open*) | | (-0.7809) | | (-0.8899) |
| **Country**: *Egypt* | | | 0.0144 | -0.0059 |
| (ref.: *Jordan)* | | | (0.3210) | (-0.1238) |
| **Country**: *Morocco* | | | 0.0038 | 0.0233 |
| (ref.:*Jordan)* | | | (0.0718) | (0.3857) |
| **Country**: *Tunisia* | | | -0.0995*** | -0.0925** |
| (ref.:*Jordan)* | | | (-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).

## 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 credit application decision.

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.

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

| **Models± Variables** | **(1a) Discrimination** | **(2a) Discrimination** | **(1b) Discrimination** | **(2b) Discrimination** |
|---|---|---|---|---|
| **Models± Variables** | **(1a) discrimination** | **(2a) discrimination** | **(1b) discrimination** | **(2b) discrimination** |
| **Industry:** *Manufacturing* | -0.0579 | -0.0034 | -0.0398 | -0.0299 |
| (ref.: *Retail and services)* | (-0.6799) | (-0.0437) | (-0.4340) | (-0.3477) |
| **Age**: *Mature* | 0.1389 | | 0.1327 | |
| (ref.: *Start-up + Young)* | (1.2501) | | (1.0094) | |
| **Ownership**: *Sole proprietorship* | 1.0250*** | | 1.0623*** | |
| (ref.: *Shareholding)* | (5.1933) | | (4.9596) | |
| **Ownership**: *Partnership* | 1.0680*** | | 1.1160*** | |
| (ref.: *Shareholding)* | (5.1706) | | (4.7944) | |
| **Financial inclusion** | -0.2028** | -0.1840** | -0.2059** | -0.1630** |
| (ref.: *Excluded)* | (-2.4562) | (-2.3898) | (-2.3216) | (-2.1005) |
| **Gender ownership**: *Female* | -0.0558 | -0.0811 | -0.0655 | -0.0560 |
| (ref.: *Male)* | (-0.5606) | (-0.8128) | (-0.6551) | (-0.5623) |
| **Sales Turnover** | -0.0201 | -0.0186 | -0.0149 | -0.0042 |
| | (-1.0243) | (-0.9849) | (-0.8424) | (-0.2386) |
| **Country**: *Egypt* | | | -0.0762 | -0.0550 |
| (ref.: *Jordan)* | | | (-0.6935) | (-0.5387) |
| **Country**: *Morocco* | | | -0.0721 | -0.1735* |
| (ref.: *Jordan)* | | | (-0.5733) | (-1.8457) |
| **Country**: *Tunisia* | | | 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).

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

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

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

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

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

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 out as the exception.

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

| Models± Variables | (1a) Discrimination | (2a) Discrimination | (1b) Discrimination | (2b) Discrimination |
|---|---|---|---|---|
| **Industry**: *Manufacturing* | 0.0502 | 0.0384 | 0.0653 | 0.0511 |
| (ref.: *Retail and services)* | (0.8347) | (0.5955) | (1.0859) | (0.7944) |
| **Financial inclusion** | -0.0086 | -0.0154 | -0.0039 | -0.0165 |
| (ref.: *Excluded)* | (-0.1567) | (-0.2664) | (-0.0724) | (-0.2854) |
| **Gender ownership**: *Female* | 0.1030 | 0.0920 | 0.0983 | 0.0968 |
| (ref.: *Male)* | (1.3927) | (1.1893) | (1.3482) | (1.2517) |
| **Education level**: *Primary school* | | 0.1076 | | 0.1012 |
| (ref.: *Tertiary)* | | (1.3397) | | (1.2509) |
| **Education level**: *Secondary school* | | 0.0209 | | 0.0346 |
| (ref.: *Tertiary)* | | (0.2466) | | (0.4032) |
| **Location of residence**:*Rural* | | -0.0575 | | -0.0203 |
| (ref.: *Urban)* | | (-0.8057) | | (-0.2796) |
| **Revenue change**: *Decrease* | | 0.0287 | | 0.0422 |
| (ref.*: Constant*) | | (0.2899) | | (0.4422) |
| **Revenue change**: *Increase* | | 0.0004 | | -0.0132 |
| (ref.*: Constant*) | | (0.0029) | | (-0.0882) |
| **Current status**: *Temporarily closed* | | -0.0599 | | -0.0521 |
| (ref.*: Open*) | | (-0.8630) | | (-0.7586) |
| **Current status**: *Permanently closed* | | -0.0352 | | -0.0833 |
| (ref.*: Open*) | | (-0.2903) | | (-0.6708) |
| **Business model adjustment** | | -0.1039* | | -0.1048* |
| (ref.: *No adjustment*) | | (-1.8485) | | (-1.8535) |
| **Country**: *Egypt* | | | -0.0689 | -0.0755 |
| (ref.: *Jordan)* | | | (-0.8292) | (-0.8570) |
| **Country**: *Morocco* | | | 0.2163** | 0.2009* |
| (ref.: *Jordan)* | | | (2.4213) | (1.9229) |
| **Country**: *Tunisia* | | | 0.0756 | 0.0794 |
| (ref.: *Jordan)* | | | (1.1893) | (1.1568) |
| 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).

# 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 to and (ii) during the COVID-19 pandemic, as well as discrimination against (female) micro-entrepreneurs (iii) prior to and (iv) during the pandemic in four MENA countries (Egypt, Jordan, Morocco and Tunisia).

Prior to 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 to the pandemic, and with respect to loan applications, 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 to 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 unrepresentative, due to a selection bias that does not offset one against the other.

Prior to the pandemic, financial inclusion runs counter 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, which remain as major drawbacks to the growth of micro-businesses, in respect of which enhanced funding policies should address.

In as much as micro-entrepreneurs do not necessarily access the loan or benefit from the support they expect, policies must create conducive conditions and foster stakeholders, in order 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, to a various extent, the 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 the 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 enhancing.

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 which are tailored to meet females' needs. Many service offerings do not comply with the 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 the enhancement of 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. In the first place, this is due to a lack of gender-disaggregated data necessary to inform policy (G20 GPFI 2020). According to the SME Finance Forum (2020), little if any data is available at country level on financing female entrepreneurs, young entrepreneurs or other key actors targeted in the promotion of financial inclusion. Data collected by international financial institutions and specialised development banks supporting the private sector remains uncoordinated, inconsistent and does not match with national SME definitions and reporting requirements of 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 those having loan accounts with MFIs and branches from 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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# 6 Appendix

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

| Country | Egypt | | Jordan | | Morocco | | Tunisia | |
|---|---|---|---|---|---|---|---|---|
| Year | 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* (1) | *23* (2) | *27* (0) | *32* (6) | *17* (0) | *31* (4) | *28* (2) | *29* (2) |
| Account in any financial institution (or mobile money service), male (aged 15+) | 37 (3) | 29 (4) | 56 (2) | 53 (15) | 41 (1) | 53 (8) | 46 (2) | 43 (5) |
| Borrowed from a formal financial institution (population aged 15+) | 9 | 7 | 18 | 10 | 3 | 5 | 12 | 10 |
| *Borrowed from a formal financial institution, female (aged 15+)* | *6* | *5* | *14* | *6* | *2* | *4* | *7* | *9* |
| Borrowed from a formal financial institution, male (aged 15+) | 11 | 10 | 21 | 13 | 4 | 6 | 16 | 11 |
| Borrowed from family or friends (population aged 15+) | 38 | 38 | 31 | 42 | 18 | 49 | 32 | 41 |
| *Borrowed from family or friends, female (% aged 15+)* | *36* | *39* | *32* | *38* | *17* | *46* | *26* | *39* |
| Borrowed from family or friends, male (% aged 15+) | 40 | 37 | 30 | 45 | 19 | 51 | 38 | 44 |
| *Borrowed to start, operate, or expand a (farm or) business, female (aged 15+)* | *2* | | *3* | | *1* | | *3* | .. |
| Borrowed to start, operate, or expand a (farm or) business, male (aged 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 | Egypt | | Jordan | | Morocco | | Tunisia | |
|---|---|---|---|---|---|---|---|---|
| Year | 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=61063966Egypt, Jordan, Morocco and Tunisia.

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

| Name | | Type | Definition | Units | Source 1 | Source 2 |
|---|---|---|---|---|---|---|
| **Characteristics of the owner** | *Gender ownership* | Discrete | *Female = 1*<br>*Male = 2* | Binary (1, 2) | WBES<br>*Calculated* | ERF |
| | *Education level* | Discrete | *Primary school = 1*<br>*Secondary school=2*<br>*Tertiary (University)=3* | Ordinal (1, 2, 3) | | ERF<br>*Calculated* |
| **Characteristics of the firm** | *Industry* | Discrete | *Manufacturing = 1*<br>*Retail and services = 2* | Binary (1, 2) | WBES<br>*Calculated* | ERF<br>*Calculated* |
| | *Size* | Discrete | Full-time permanent staff<br>*Micro: 1-9 employees = 1* | Ordinal (1) | *WBES*<br>*Calculated* | ERF<br>*Calculated* |
| | *Age* | Discrete | Number of years<br>*Start-up + young <8 years = 1*<br>*Mature >=8 years = 2* | Binary (1, 2) | WBES<br>*Calculated* | |
| | *Ownership* | Discrete | *Sole proprietorship = 1*<br>*Partnership = 2*<br>*Shareholding = 3* | Ordinal (1, 2, 3) | WBES<br>*Calculated* | |
| | *Financial inclusion* | Discrete | *Excluded* (no bank account) = *0*<br>*Included* (bank account) = *1* | Dummy (0,1) | WBES | ERF<br>*Calculated* |
| | *Local of residence* | Discrete | *Rural= 1*<br>*Urban = 2* | Binary (1, 2) | | ERF |
| **Funding of the firm** | *Personal loans* | Discrete | *No personal loans =0*<br>*Personal loans funding business activities =1* | Dummy (0, 1) | WBES | ERF<br>*Calculated* |
| | *Self-selection prior COVID-19* | Discrete | *Need and no loan deman before COVID-19=0*<br>*Need and loan demand before COVID-19=1* | Dummy (0, 1) | WBES<br>*Calculated* | ERF<br>*Calculated* |
| | *Self-selection during COVID-19* | Discrete | *Need and no demand for support during COVID-19=0*<br>*Need and demand for support during COVID-19=1* | Dummy (0, 1) | WBES<br>*Calculated* | ERF<br>*Calculated* |
| | *Discrimination during COVID-19* | Discrete | *Rejected =0*<br>*Granted =1* | Dummy (0, 1) | WBES<br>*Calculated* | ERF<br>*Calculated* |
| **Activity of the firm** | *Sales Turnover* | Continuous | *Ln(Sales turnover)* as of 2019 | Currency unit | WBES<br>*Calculated* | ERF<br>*Calculated* |
| | *Revenue change (compared to 2019)* | Discrete | *Decrease=1*<br>*Increase=2*<br>*Constant=3* | Ordinal (1, 2, 3) | | ERF<br>*Calculated* |
| | *Current status* | Discrete | *Temporarily closed=1*<br>*Permanently closed =2*<br>*Open=3* | Ordinal (1, 2, 3) | | ERF<br>*Calculated* |
| | *Business model adjustment* | Discrete | *No=0*<br>*Yes=1* | Dummy (0, 1) | | ERF<br>*Calculated* |
| **Control variables** | *Country dummies* | Discrete | *Egypt=1*<br>*Morocco=2*<br>*Tunisia=3*<br>*Jordan=4* | 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)± | | | | | Gender ownership (ERF)±± | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Female | % | Male | % | Total | Female | % | Male | % | Total |
| **Country** | *Egypt* | 45 | 5.25 | 812 | 94.75 | 857 | 30 | 7.92 | 349 | 92.08 | 379 |
| | *Morocco* | 27 | 12.05 | 197 | 87.95 | 224 | 82 | 10.53 | 697 | 89.47 | 779 |
| | *Tunisia* | 32 | 27.12 | 86 | 72.88 | 118 | 96 | 20.82 | 365 | 79.18 | 461 |
| | *Jordan* | 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 |
| **Industry** | *Manufacturing.* | 59 | 7.66 | 711 | 92.34 | 770 | 43 | 7.61 | 522 | 92.39 | 565 |
| | *Retail & services* | 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 |
| **Size** | *Micro* | 147 | 10.28 | 1.283 | 89.72 | 1.430 | 245 | 12.37 | 1.734 | 87.62 | 1.979 |
| | *Excluded* | 36 | 6.79 | 494 | 93.21 | 530 | 133 | 12.61 | 922 | 87.39 | 1.055 |
| **Financial inclusion** | *Included* | 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 |
| ***Loan demand (prior to COVID)*** | *No Demand* | 124 | 9.70 | 1.155 | 90.30 | 1.279 | 149 | 11.71 | 1.123 | 88.29 | 1.272 |
| | *Demand* | 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 |
| ***Loan outcome application* (prior to COVID)*** | Rejected | 2 | 13.33 | 13 | 86.67 | 15 | | | | | |
| | Granted | 14 | 17.28 | 67 | 82.72 | 81 | | | | | |
| | Total | 16 | 16.67 | 80 | 83.33 | 96 | | | | | |
| ***Personal loan*** | *No personal loan* | 113 | 9.07 | 1.133 | 90.93 | 1.246 | 124 | 10.94 | 1.009 | 89.06 | 1.133 |
| | *Personal loan* | 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 |
| ***Self-selection (prior to COVID)*** | *No* | 16 | 15.53 | 87 | 84.47 | 103 | 44 | 14.67 | 256 | 85.33 | 300 |
| | *Yes* | 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:*** ± N= 1,430. ±± 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. Amongst 1,279 firms not applying for a loan, data is 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 | | | | |
| *Egypt* | + | *Egypt* | *NS* | *Egypt* | *NS* | | |
| *Morocco* | + | *Morocco* | - | *Morocco* | - | | |
| *Tunisia* | + | *Tunisia* | + | *Tunisia* | *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 |
| | | *Egypt* | *NS* | | | *Egypt* | *NS* |
| | | *Morocco* | *NS* | | | *Morocco* | + |
| | | *Tunisia* | - | | | *Tunisia* | *NS* |

***Note***: NS= insignificant. Country dummies in Italics.
***Source***: Authors

# ABOUT EMANES

The Euro-Mediterranean and African Network for Economic Studies (EMANES) is a network of research institutions and think tanks working on socio-economics policy in Europe, the Mediterranean and Africa. EMANES is coordinated by the Euro-Mediterranean Economists Association (EMEA).

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