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Gender Differences in Firm Performance: Selection and Misallocation in Mexico

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Abstract

We analyze micro-scale businesses in Mexico and find large gender gaps in sales, profit, and access to finance. Accounting for differences in education and entrepreneurial commitment, women-owned firms perform worse and receive less financing than comparable men-owned firms. We interpret these patterns in a model economy where individuals with different managerial abilities choose between wage work and entrepreneurship, while women face discrimination in labor and credit markets. The model replicates observed gender differences in occupations and capital use. Equalizing credit access sharply reduces gender gaps in entrepreneurial earnings, but implies only modest aggregate gains on productivity and output. Size-dependent taxes or income subsidies generate smaller impacts or far more costly gains.

JEL: J16, O1, O4, O5.

Key Words: informality, gender, micro-firms, misallocation, finance

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1 Introduction

Gender disparities in earnings are a well-documented fact. After decades of female progress in the labor market, persistent social norms and working arrangements that are unfavorable to women are often cited as the main remaining culprits behind observed gender inequality in labor market outcomes for wage workers (Goldin, 2014). Nevertheless, our understanding of gender differences in entrepreneurial activities and earnings is not nearly as robust. In an economy where individuals freely choose between wage work and self-employment, there is likely to be an interconnection between adverse labor-market conditions that penalize women and their decision to become an entrepreneur. Furthermore, women may also face more obstacles running a business compared to their male peers, such as differential access to finance.

In this paper, we use a unique dataset of micro-scale businesses in Mexico to document significant gender gaps in sales, profit, and access to finance. We find that the median female-owned business earns 45 percent less sales and profit relative to its male counterpart. The gender difference in capital is even more pronounced: women-led businesses operate with a capital stock that is nearly 60 percent lower than that of businesses run by men. We also find vast differences in access to finance across gender.[1] The average revenue product of capital is 28 percent higher for women implying that female entrepreneurs face lower access to credit. Our results are robust to empirical specifications that include standard demographic, economic and industry controls, in addition to relevant factors that are unique to our dataset such as motivation for running a business, education, whether the entrepreneur has employees, a physical location, and number of days worked. While these estimates are based on micro-scale businesses that account for over 95 percent of the size distribution of firms in Mexico, we conjecture these gaps are also highly relevant for understanding differences in firm performance by gender among larger firms.

[1] We measure access to finance based on the average revenue product of capital as commonly done in the literature (Hsieh and Klenow, 2014; Morazzoni and Sy, 2022; Goraya, 2023; Tan and Zeida, 2024).

We interpret these patterns in a model of occupational choice, where individuals vary in their levels of wealth and managerial ability, and face gender-based discrimination in both the labor and financial markets. In line with the evidence above, we use our model to infer gender differences in access to finance, which we model as collateral constraints on borrowing (Buera et al., 2011; Moll, 2014). We find wide differences in access to finance where men can borrow nearly twice as much as women of equivalent wealth.

A known feature in poorer countries, and especially in the context of Mexico, is that women face adverse labor-market conditions and earn lower wages than men (Cuellar and Moreno, 2022). A key aspect of our model is to account for this labor market discrimination against women which induces negative selection into entrepreneurship, even though women also face adverse circumstances as business owners in the form of lower access to finance. This interplay between labor and financial market discrimination remains largely unexplored in the literature. We calibrate the model to match key moments from our micro-business dataset, and show that the model can match key features of the firm size distribution covering firms of all sizes. Importantly, our model closely replicates occupational sorting by gender, as well as the allocation of capital and relative firm size differences across gender.

We then study three counterfactual scenarios. Under our first counterfactual, we find that equalizing female access to finance reduces the average gender gap in entrepreneurial earnings by nearly half, and increases total factor productivity (TFP) and output by a half and one percent respectively. These effects are small compared to the literature because in our setting labor market discrimination amplifies negative selection into entrepreneurship among women, dampening aggregate gains. Second, we remove female labor market discrimination to eliminate the gender wage gap. In general equilibrium, wage equalization implies not only an increase in female wages but also a decrease in male wages, as well as selection effects across gender. In our numerical exercise, the positive selection effect on female entrepreneurship is perfectly offset by the negative selection effect on male entrepreneurship. The result is greater gender equality in both wages and entrepreneurial earnings, which increases female

well-being as measured by consumption. However, there are only modest effects on TFP and aggregate output. When gender based discrimination in financial and labor markets are both removed, TFP and output rise by 1.5 percent. We emphasize these aggregate effects are proportionally large since our model accounts for the fact women represent a smaller share of the labor force. In our third exercise, we double access to finance for both men and women but allow for female labor market discrimination. The aggregate effects are larger: TFP and output increase by four and five percent. The average gender gap in entrepreneurial earnings is reduced by 36 percent, which implies that women disproportionally benefit from better access to finance, even though the disparity in access to finance relative to men is unchanged. Importantly, both male and female consumption rises and is proportionally higher for women. This result highlights the fact that Mexico is a country with a remarkably low level of financial development (López, 2017b). In such an environment, a gender-neutral increase in access to finance will benefit the most constrained entrepreneurs—a group where women are disproportionally represented.

Next, we explore the effects of two policies that aim to improve female economic outcomes. First, we introduce a gender-neutral size-dependent tax aimed at larger firms, and subsidies to smaller firms.[2] We find that at relatively low average effective tax/subsidy rates (below four percent), the aggregate effects are quantitatively comparable to a policy that eliminates all gender based discrimination. The rationale behind this result is that a size-dependent tax induces unconstrained large firms to shrink (where the marginal product of capital is lowest) and subsidized constrained smaller firms to expand (mostly women, and where the marginal product of capital is higher). While this raises incumbent female entrepreneur profit, labor market discrimination induces disproportional entry by less productive women, such that on net it does little to reduce the average entrepreneurial earnings gap between men and women.

In our last policy experiment, we study the effects of a female-targeted income subsidy. This

[2]We follow the approach in Qian and Vereshchagina (2024) and we set up the tax so that it is revenue-neutral.

policy alleviates earnings inequality to varying degrees and generates output gains comparable to our counterfactual exercise that removes all gender based discrimination. Subsidizing women's earnings offsets some of the negative selection effects into entrepreneurship stemming from discrimination in the labor market. However, this policy costs nearly five times the boost in output it generates. The main point of these alternative policy experiments is to show that there are no ideal policy substitutes for financial development.

Our work relates to the macro-development literature studying female entrepreneurship. Closely related to our work is Chiplunkar and Goldberg (2024) who study gender barriers to female entrepreneurship across the formal–informal divide.[3] They infer broad average distortions on production that differ across gender and formality. In contrast, our data allow us to document differences in access to finance by gender, which together with labor market discrimination in occupational sorting we explicitly model to evaluate its quantitative importance. In addition, we use the unique features of our data to show that while there is within group variation in firm performance among educated, single and 'serious' entrepreneurs, these factors nevertheless do not explain away the differences in firm performance we document across gender.

Also related are papers that examine differences in access to finance across sub-groups and model them as collateral constraints on borrowing. For instance, Morazzoni and Sy (2022) document sharp differences in access to finance across gender in the U.S., and Goraya (2023) focuses on differences in access to finance across caste groups in India.[4] While we employ similar modeling techniques to assess differences in access to finance, we distinguish our work in two main ways. First, we show that among micro-scale firms where women are

[3]Related to gender in India, Khera (2020) and Ranasinghe (2024a) examine gender specific distortions on production and its aggregate impacts. In cross-country analyses, Cuberes and Teignier (2016) and Ranasinghe (2024b) document distortions on production across gender, and Lee (2024) focuses on gender related distortions and sorting across agriculture and manufacturing sectors. Specific to Mexico, see also Angel (2023) who studies gender and informality using aggregate data to infer average distortions.

[4]In a related context for the US, Tan and Zeida (2024) document differences in access to finance and markups across black entrepreneurs, and Bento and Hwang (2023) show that black entrepreneurs face barriers to expansion. See also Hsieh et al. (2019) who examine the allocation of talent across gender and race in the US over time.

disproportionally over-represented there are large profit gaps across gender (Hardy and Kagy, 2018), and accounting for differences in capital and a person's outside option narrows this gap. Second, we allow for the inter-play of two gender based frictions to show the aggregate impacts of improving access to finance are smaller than typically predicted in the literature due to negative selection from women facing adverse impacts in labor markets.

Lastly, our work relates to the literature that examines occupational sorting across formality and its aggregate impacts. For instance, Leal Ordóñez (2014) models entrepreneurship and informality in Mexico, while López (2017a) and Lopez-Martin (2019) focus on tax evasion and differential access to finance across formality. While similar across many aspects, our emphasis is on differential access to finance and labor market discrimination across gender, and that improving finance across the board is more relevant for growth and gender earnings equality than targeted policies specific to business groups.

The rest of the paper is organized as follows. In Section 2 we describe our main dataset and present the main empirical findings at the core of our analysis. In Section 3 we introduce a model that captures what we consider the main mechanisms behind our findings. We describe our calibration strategy in Section 4. Results from our calibration and counterfactual exercises are discussed in 5. Section 6 concludes.

2 Micro-scale firms in Mexico

2.1 Data Description

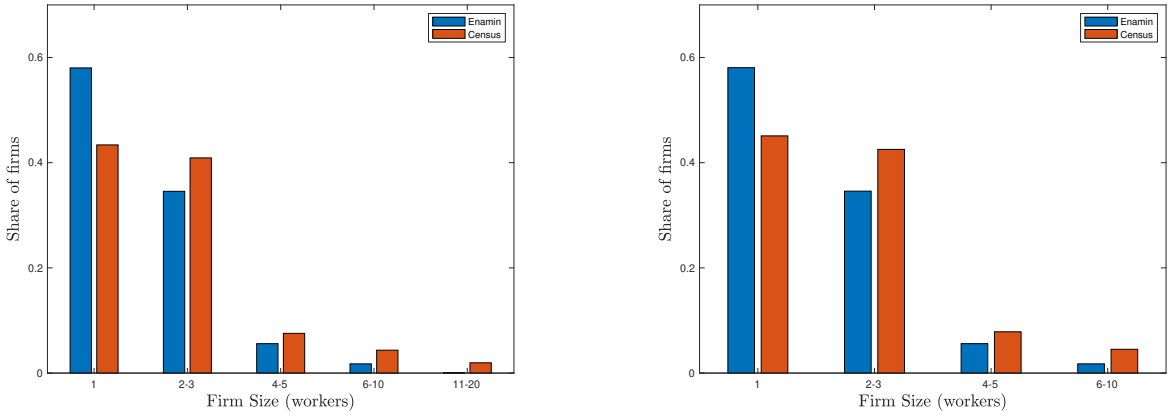
We use the National Micro-business Survey (ENAMIN) from 2012 to document differences across micro-scale firms by entrepreneur gender in Mexico. The survey is jointly implemented by the Ministry of Labor and Social Welfare, and the National Institute of Statistics and Geography to provide information on key characteristics of micro-businesses in order to foster

policies that aid the advancement of these businesses.

A key feature of the ENAMIN survey is the coverage of micro-scale businesses, which account for the overwhelming majority of businesses in Mexico, and allows for an accurate assessment of barriers to business operation these firms face. The ENAMIN is part of the broader National Survey of Occupation and Employment (ENOE) which provides a comprehensive view of the Mexican labor force. Thus, the ENAMIN also reports business owner income (profit) and their demographic characteristics—which are normally absent in firm-level surveys—such as gender and marital status, among many others. Moreover, the survey includes unique and highly important business characteristics such as motivation for starting a business, that we explain in more detail later. For these reasons, we confine our analysis to the ENAMIN surveys. We use the more conventional Economic Census, which covers all firms but without business owner characteristics, to supplement our analysis as needed. In what follows, we use firm to refer to all businesses, and also use firm and entrepreneur interchangeably when convenient.

Because the ENAMIN data primarily covers micro-scale firms we briefly compare the coverage of the firm size distribution in the ENAMIN and the Economic Census—which covers the full size distribution of firms—to provide a sense of the size of firms we can analyze. Figure 1 panel (a) plots the share of firms across firm size categories and panel (b) plots a re-weighted distribution among firms with fewer than 10 workers. Based on the Economic Census, 98 (96) percent of firms have fewer than 20 (10) workers in Mexico. Hence, while the ENAMIN surveys do not cover large firms (more than 10 workers), they are nevertheless representative of about 96 percent of the size distribution of firms in Mexico. We recognize that these surveys do not cover larger firms that account for the majority of production. Figure 1 also shows the ENAMIN over samples own-account businesses (i.e., self-employed business owners who do not have employees) relative to the Economic Census. Nevertheless, we view the ENAMIN surveys as well suited for our analysis, and in some instances superior given its coverage of own-account business owners, as our focus is on the margins of entrepreneurship

Figure 1: Firm Size Distribution Coverage



(a) (b)

Notes: Panel a shows distribution of firms based on the ENAMIN and the Economic Census. Panel b shows the distribution weighted relative to firms with fewer than 10 workers.

which especially matter when examining differences across gender. In addition, these firms are especially relevant given their potential for growth and job creation as highlighted in Haltiwanger et al. (2013).

The ENAMIN surveys cover firms across manufacturing and services (including trade and construction), where services account for over 80 percent of observations. As these are micro-scale firms that use little to moderate levels of capital we focus on the full sample and make no distinction between manufacturing and services (in the Appendix we focus only on service sector firms). The surveys are especially useful as it reports entrepreneur, or business owner, gender and statistics related to sales, profit, inventory, capital and workers hired. As these are micro-scale firms, also reported are several measures related to formality: whether the firm is registered, keeps formal accounts, or issues receipts. However, and as noted by Ulyssea (2018), informality is highly nuanced and extends beyond a simple dichotomy of formal–informal.[5] In our data, while various firms satisfy a single measure related to formality, less than 2 percent satisfy all measures and so we make no distinction between formal and

[5]Ulyssea (2018) documents that firms in poorer economies may satisfy a subset of checks related to formality such as paying taxes, issuing receipts, official accounts and registration, but very few, including larger firms, satisfy all of them.

informal firms, and especially because we examine micro-scale firms.

The ENAMIN is also ideal for our purposes as it reports entrepreneur characteristics (education, experience, age, marital status), and days worked per week in the business. Also included is an entrepreneur's motivation for starting a business, which include a variety of questions that we condense as due to lack of outside options, to have a flexible schedule, to supplement household income, or whether a serious entrepreneur (start a business to increase income, found a business opportunity or have a passion for entrepreneurship). Again, we stress these information are unique to this survey and is typically absent in traditional firm-level surveys. This information becomes especially useful when examining micro-scale firms, specifically how serious or committed an entrepreneur is, as they can shape decisions related to entrepreneurship and its scale, issues that are highly relevant when comparing differences across gender.

Table 1: Descriptive Statistics across Gender in Mexico

	Male	Female
# of firms	7682	5378
Market shares		
share of entrepreneurs	0.59	0.41
share of sales	0.73	0.27
share of capital	0.61	0.39
share of workers	0.62	0.38
Averages		
firm size	1.83	1.60

Notes: Statistics are based on the ENAMIN 2012. See text for details.

2.2 Empirical Analysis

Table 1 reports descriptive statistics for micro-scale firms by entrepreneur gender (the sample is restricted to firms reporting positive values and trimmed at the 1 percent level). Among these firms women account for 41 percent of all firms, and a smaller share of workers, capital and sales, and disproportionally so for sales (27 percent). These results are especially notable

since the data does not account for large firms where women are more under-represented. Said differently, among micro-scale firms where women are more likely to be disproportionally over represented, women still account for less than 50 percent of all firms and an even smaller share of the market. Hence, this evidence supports the view of female underrepresentation in entrepreneurship along all segments of the firm size distribution, including among very small/micro firms.

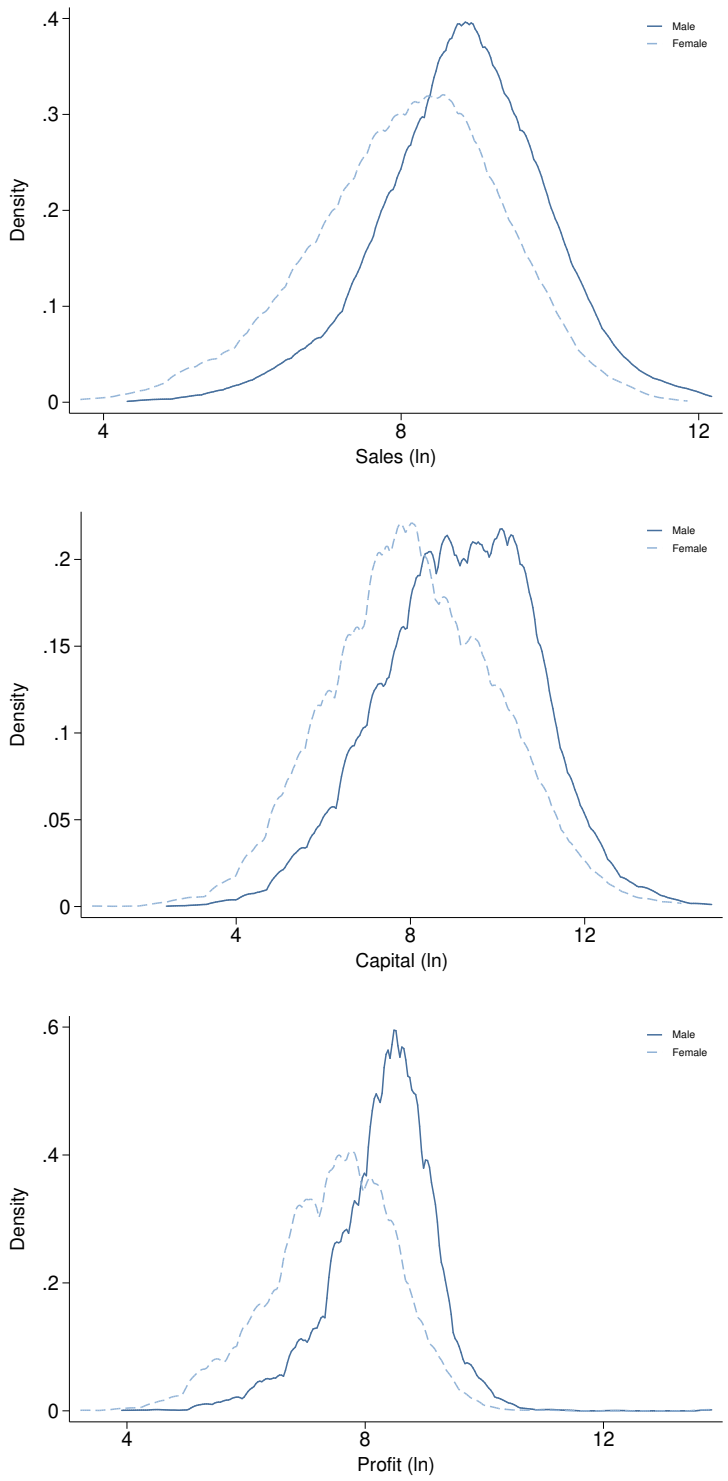
Moving beyond market shares, Figure 2 shows the distribution of sales, capital and profit among these firms, broken down by gender. In each of the sub-figures the distribution for women is right-skewed relative to the distributions for men, meaning that women typically have lower sales, capital, and earn less profit than men. In addition, female owned firms are disproportionally represented among firms that report low sales, capital and profit.

To further evaluate differences by gender, Table 2 reports (non-causal) estimates for firm sales, in logs, on entrepreneur gender, with a variety of control variables. Column (1) includes controls for industry, column (2) adds controls for entrepreneur characteristics such as education, experience, age and marital status, column (3) adds controls related to firm size and proxies for formality status (have a physical store location, and indicators for whether formally registered, have formal accounts and issue receipts), and column (4) adds days worked per week and motivation for starting a business to control for how serious and committed an entrepreneur is.[6] We emphasise that accounting for marital status, education, and motivation for starting a business are especially important when analyzing differences across gender as a woman's decision to enter into entrepreneurship and its scale can be shaped by family needs or societal norms than typical profit motives, at least presumably more so than for a man.

The estimates in Table 2 confirm the patterns in Figure 2 that women earn lower sales than

[6]In the Appendix we describe these variables in more detail. The share of men and women that work 5 or more days a week are 80 and 78 percent. Regarding motivation for starting a business, 51 and 30 percent of men and women are defined as 'serious' entrepreneurs. All regression results hold among these sub-samples, and are examined in Section 2.3.

Figure 2: Firm Performance by Gender



Notes: A Kolmogorov-Smirnov test for equality of distributions across gender is rejected ($p < 0.01$) for each of the sub-figures.

men. Notably, we find that including controls for education, marital status and whether the business has a physical location lowers the female gap; in addition, accounting for 'motivation' also narrows the female gap, suggestive that lower sales is related to these controls including differences in commitment to entrepreneurship (relative to men). Based on our preferred estimates in column (4) which include the full-set of controls, women earn 46 percent lower sales than men. Tables 3 and 4 report female estimates for capital and profit. When accounting for the full-set of controls, women use 57 percent less capital in production and earn 45 percent less profit relative to men. Again, we stress these differences across gender are based on a sample of micro-scale firms; a size group where differences in barriers to entry across gender are likely minimal, where the decision to operate a firm is highly relevant, and where women are disproportionally represented.

Table 2: Firm sales by entrepreneur gender

	(1)	(2)	(3)	(4)
Female	-0.85***	-0.75***	-0.68***	-0.61***
	(0.02)	(0.03)	(0.02)	(0.02)
Controls :				
Industry	✓	✓	✓	✓
Entrepreneur traits	–	✓	✓	✓
Size	–	–	✓	✓
Motivation	–	–	–	✓
N	12325	11680	11680	11412
R^2	0.100	0.192	0.282	0.310

Notes: See text for details. Industry controls for service, manufacturing, trade or construction; Entrepreneur traits control for education, experience, age and marital status; Size controls for whether the firm has a physical location, and indicators for whether the firm is registered, has formal accounts and issues receipts; and Motivation controls for reasons for starting a business and days worked. Standard errors are in parenthesis and ***, **, * denote significance at the 1, 5 and 10 percent level.

Our female estimates for profit are consistent with Hardy and Kagy (2018) who examine micro-scale firms in a garment sector in Ghana. They also use a unique dataset that controls for an entrepreneur's education, marital status and motivation for operating a business to argue that gender differences in profit go beyond these novel set of controls. As we later focus

Table 3: Firm capital by entrepreneur gender

	(1)	(2)	(3)	(4)
Female	-1.26***	-1.03***	-0.90***	-0.85***
	(0.04)	(0.04)	(0.04)	(0.04)
Controls:				
Industry	✓	✓	✓	✓
Entrepreneur traits	–	✓	✓	✓
Size	–	–	✓	✓
Motivation	–	–	–	✓
N	13060	12373	12373	12061
R^2	0.090	0.193	0.323	0.330

Notes: See text for details. Industry controls for service, manufacturing, trade or construction; Entrepreneur traits control for education, experience, age and marital status; Size controls for whether the firm has a physical location, and indicators for whether the firm is registered, has formal accounts and issues receipts; and Motivation controls for reasons for starting a business and days worked. Standard errors are in parenthesis and ***, **, * denote significance at the 1, 5 and 10 percent level.

Table 4: Firm profit by entrepreneur gender

	(1)	(2)	(3)	(4)
Female	-0.82***	-0.73***	-0.67***	-0.60***
	(0.02)	(0.02)	(0.02)	(0.02)
Controls:				
Industry	✓	✓	✓	✓
Entrepreneur traits	–	✓	✓	✓
Size	–	–	✓	✓
Motivation	–	–	–	✓
N	12501	11848	11848	11549
R^2	0.160	0.272	0.340	0.363

Notes: See text for details. Industry controls for service, manufacturing, trade or construction; Entrepreneur traits control for education, experience, age and marital status; Size controls for whether the firm has a physical location, and indicators for whether the firm is registered, has formal accounts and issues receipts; and Motivation controls for reasons for starting a business and days worked. Standard errors are in parenthesis and ***, **, * denote significance at the 1, 5 and 10 percent level.

on the impacts of gender specific wages and access to capital in a quantitative model, we include an entrepreneur's reservation wage and their capital as additional control variables to the profit regression in Table 4 column (4). Endogeneity concerns notwithstanding, we find that accounting for the reservation wage and capital substantially lowers the female estimate

for profit.[7] In this regard, differences in access to capital and outside earning potential (i.e., reservation wage) are important factors for understanding gender differences in profit.

Related to this, a central theme in the misallocation literature is that distortions on production, in particular capital financing constraints (Buera et al., 2011), affect the allocative efficiency of resources and in turn overall productivity. We explore whether distortions on production matter for understanding the patterns documented, and how it varies across gender. As we focus on micro-scale firms where there is little variation in firm size, we naturally abstract from labor market distortions and focus on capital distortions, which we measure using the average revenue product of capital ($arpk$) as is standard in the literature. Higher values for $arpk$ are indicative of higher capital distortions such as limited access to finance or higher borrowing costs.

Table 5 reports the estimates for $\ln(arpk)$ for women and includes a similar set of controls as in the previous tables. To the extent that $\ln(arpk)$ is a suitable measure for firm level capital distortions (or limited access to finance), the estimates show that female firms face higher capital distortions on production.[8] Based on column (4), a female firm faces a 28 percent higher capital distortion relative to a male firm. While we have focused on the $arpk$, in the appendix we show that our estimates also hold when measuring capital distortions based on the inverse of capital per worker. In addition, our results also hold when using capital relative to the wage bill to account for differences in worker quality. We view this as consistent evidence that female business owners face more restrictive access to finance at the lower tail of the firm size distribution. And in line with the misallocation literature, these higher capital distortions are consistent with women accounting for a small share of entrepreneurship, both at the extensive and intensive margins.

[7] The sample size falls to about 7,400 as not all entrepreneurs report their reservation wage. Based on this smaller sample, the female estimate for profit in column 4 is -0.65 with an $R^2 = 0.36$; when adding the reservation wage and capital the female estimate falls to -0.39 with a $R^2 = 0.49$.

[8] Tan and Zeida (2024) show that the $arpk$ can reflect markup differences when controlling for capital–labor ratios. Following their approach, we find some evidence that women charge lower markups relative to male firms.

Table 5: Capital distortions by entrepreneur gender

	(1)	(2)	(3)	(4)
Female	0.39***	0.28***	0.23***	0.25***
	(0.04)	(0.04)	(0.04)	(0.04)
Controls:				
Industry	✓	✓	✓	✓
Entrepreneur traits	–	✓	✓	✓
Size	–	–	✓	✓
Motivation	–	–	–	✓
N	12325	11680	11680	11412
R^2	0.026	0.057	0.102	0.104

Notes: See text for details. Industry controls for service, manufacturing, trade or construction; Entrepreneur traits control for education, experience, age and marital status; Size controls for whether the firm has a physical location, and indicators for whether the firm is registered, has formal accounts and issues receipts; and Motivation controls for reasons for starting a business and days worked. Standard errors are in parenthesis and ***, **, * denote significance at the 1, 5 and 10 percent level.

Comparison to the WBES. While the ENAMIN facilitates comparison across micro-scale firms by gender, a limitation is the lack of coverage among large firms that account for the bulk of production. We use the World Bank Enterprise Surveys (WBES) for Mexico (2010) to evaluate differences in market shares by gender among larger firms, and specifically to compare with the market shares among micro-scale firms documented in Table 1. The WBES is a nationally representative survey of formal firms that report sales, capital and workers at the firm-level, and importantly for our purposes is one of the only datasets that include business owner gender.[9] In Table A.1 we report market shares by gender across various firm size bins. We use this data to complement the ENAMIN data and make two broad points. First, when the sample is restricted to firms with fewer than ten workers (panel A), which is the closest comparison to the sample of micro-scale firms in the ENAMIN, the share of female entrepreneurs is lower but in range with the ENAMIN sample; female market

[9]We define a firm in the WBES as female owned if any one of the owners is female, and note the main patterns we document also hold when defining a firm based on the top manager's gender. We restrict the sample to firms that report positive values for sales, capital and workers and trim extreme values at the 1 percent level. A limitation is that service sector firms do not report capital and hence we restrict the sample to manufacturing firms.

shares are essentially the same, especially for capital. Second, as the sample is expanded to larger firms (panels B through E), a pattern is that female market shares fall: the share of female entrepreneurs stabilizes at 20 percent while female market shares for sales, capital and workers consistently decrease as larger firms are sampled.

Taking all of this evidence together, women account for a low share of entrepreneurs and market shares among micro-scale firms. Female firms consistently earn lower sales, profit and face higher capital distortions. In addition, these patterns hold across a host of highly relevant business owner characteristics and controls. We view these capital distortions, or limited access to finance, that especially burden female micro-scale businesses as symptomatic of a broader issue that restricts highly talented female entrepreneurs from expanding to become successful, large businesses.

2.3 Sensitivity

We now evaluate the sensitivity of our results, and specifically whether there is heterogeneity across women in regards to firm performance and access to finance. In particular, we examine whether certain sub-groups of women, based on demographic characteristics, disproportionally face higher capital distortions, and whether they primarily drive the patterns related to gender documented. We focus on differences by education, how serious an entrepreneur is, and marital status. All tables are reported in the Appendix.

In our sample, 12 percent of women are highly educated—completed college, professional or graduate schooling—while 17 percent of men are highly educated. To evaluate *within* differences across women by education, we regress variables of interest on an indicator for whether a woman is highly educated together with our previous control variables. We find that highly educated women earn higher sales, profit and face lower capital distortions relative to non-high educated women.[10] To assess whether non-high educated women are driving the

[10]High educated women earn 35 percent higher sales, 42 percent more in profit and 33 percent lower capital

result that women business owners under-perform and face higher capital distortions, we re-run the regressions from Section 2.2 but restrict the sample to highly educated men and women. Among this highly educated group, where the sample size is 85 percent smaller, we find consistent evidence that women earn lower sales, use less capital, earn lower profit, and mild evidence they face higher capital distortions relative to men (Table A.6).

We also evaluate whether our results are potentially due to women being less serious or committed to entrepreneurship. Our estimates on firm performance and distortions (Table 2 and 5) show that motivation for operating a business is important to get a more complete picture of the differences in outcomes across business owner gender. In our sample, about 30 (50) percent of women (men) business owners are classified as 'serious' entrepreneurs (i.e., start a business to increase income, found a business opportunity or have a passion for entrepreneurship). Among women business owners, we find evidence that those classified as serious entrepreneurs earn higher profit and have lower capital distortions relative to non-serious women entrepreneurs (Table A.7). Nonetheless, when we restrict the sample to serious entrepreneurs we still find that women earn lower sales, profit and face higher capital distortions relative to men (Table A.8).[11] Along this line, we also explore whether there are differences within and across gender based on whether an entrepreneur operates from a physical store—an additional measure to gauge entrepreneur commitment and wealth. As we report in Tables A.9 and A.10, we find that women who operate from a store perform better and face lower distortions relative to women that do not, but nevertheless underperform and face higher distortions relative to men who operate from a physical store.

We also evaluate the role marital status has on our results as women in our sample are disproportionally less likely to be married (65 percent versus 80 percent for men). Marital status can be a benefit for women's entrepreneurship from having an additional adult in the household (e.g., being a double income household, and/or help with child rearing and domestic chores),

distortion (based on $arpk$), and is reported in Table A.5.

[11] These patterns also hold when we define a serious entrepreneur as one that works five or more days per week in the business.

and a hinderance if entrepreneurship is merely to supplement household income or to have a flexible schedule. In our sample, 28 (34) percent of married (unmarried) women are classified as serious entrepreneurs, whereas for men 50 percent are serious, irrespective of marital status. This is suggestive of differences in entrepreneurial motivation based on marital status across gender. We find that married women earn lower sales and profit relative to unmarried women suggestive of a negative marriage tax on female firm performance; however, we find no statistical difference in capital distortions relative to unmarried women suggestive of no marriage premium via easier access to finance (Table A.11). When restricting the sample to married people, women continue to under-perform and face higher capital distortions relative to men (Table A.12), and with similar results when focusing on un-married people.

Finally, we examine whether female firm performance—sales, capital and profit—and distortions differ across industries. Not surprisingly, we find a smaller (larger) gap in female firm performance in the service (manufacturing) sector, and in both industries women face higher distortions. In trade related industries, women under-perform relative to men but do not face higher distortions (statistically), though we note the sample size is small (less than 2000 observations).

Overall, we find within group variation in firm performance and access to finance (capital distortions) among high educated, serious and married women entrepreneurs. Nevertheless, the heterogeneity we observe within women does not explain away the discrepancies in firm performance and access to finance by gender we document.

3 Model

We now present a model with differential access to capital to examine its implications for selection in to entrepreneurship, earnings inequality across gender, as well as gender differences in market shares. Specifically, we consider a setting where people have heterogeneous

entrepreneurial ability and different wealth levels, and choose whether to work for a firm earning a wage or operate a firm. We abstract from decisions related to labor force participation as in our setting it will have modest quantitative impacts. We model differential distortions on capital documented in Section 2 as differences in access to finance driven by a collateral constraint on borrowing capital, as in Buera et al. (2011) and Moll (2014), and which varies across gender. In addition, we allow for differences in wages across gender consistent with the evidence in the ENOE. Aside from differences in access to finance and wages, we assume no additional differences across gender. The particulars of the model are described below.

3.1 Environment

The economy is populated by Λ_f women and Λ_m men, and where the latter is normalized to one. People are heterogenous in entrepreneurial ability $z_{gi} \in Z$, where $g \in \{m, f\}$ refers to male and female, i is a particular individual, and $F(z)$ is a common ability distribution for men and women. People also differ in asset holdings $a_{gi} \in A$. For ease of notation, we use z and a and note these are individual and gender-specific. The cumulative distribution over assets and ability is $\varphi(z, a)$. We consider a dynamic setting where ability evolves according to a Markov process $M(z, z')$ and assets evolve based on savings decisions. Each person has an indivisible unit of time that is allocated to being a worker or operating a firm as an entrepreneur. Workers earn a wage w_g where $w_m > w_f$ implies a man earns a higher wage than a woman.

The problem of the entrepreneur/firm is to maximize per-period profit using a production technology subject to a borrowing friction on capital that we specify later. In particular, an entrepreneur takes their ability, current level of assets, and prices as given, and chooses capital k and a composite labor input n to maximize profit $\pi(k, n; z, a, r, \bar{w})$, where r is the risk-free rate, and $\bar{w}$ is a wage index. The composite labor input is based on a Constant Elasticity of Substitution (CES) technology that uses male and female workers. Specifically,

once optimal firm size n is known, firms choose male and female workers (n_m, n_f) to solve

$$\min_{n_f, n_m} \; w_f n_f + w_m n_m \;\; s.t. \left(\phi^{1-\rho} n_f^{\rho} + (1-\phi)^{1-\rho} n_m^{\rho}\right)^{\frac{1}{\rho}} = n. \tag{1}$$

Note here that $\rho < 1$ measures the substitutability between male and female workers and $0 < \phi < 1$ measures the importance of female workers in production. It follows that the Hicksian demand for male and female workers are

$$n_f = \phi \left(\frac{w_f}{\bar{w}}\right)^{-\sigma} n \;\; \text{and} \;\; n_m = (1-\phi) \left(\frac{w_m}{\bar{w}}\right)^{-\sigma} n,$$

where $\sigma \equiv 1/(1-\rho)$ and the wage index is

$$\bar{w} = \left[\phi w_f^{1-\sigma} + (1-\phi) w_m^{1-\sigma}\right]^{\frac{1}{1-\sigma}}.$$

Firm problem: Entrepreneurs choose capital k and composite labor n to maximize period profit based on

$$\pi_g(a,z) = \max_{k,n} \;\; z\left(k^{\alpha} n^{1-\alpha}\right)^{\theta} - (r+\delta)k - \bar{w}n \;\; s.t. \;\; k \leq \lambda_g \cdot a, \tag{2}$$

where we assume a span-of-control production technology $(0 < \theta, \alpha < 1)$ that favors higher ability entrepreneurs.[12] Firms borrow capital from financial markets paying the user cost of capital $r + \delta$, and we denote optimal, or unconstrained, capital and labor inputs as $k(z)$ and $n(z)$—optimal inputs depend only on productivity and not assets. We model capital distortions as a collateral constraint $\lambda_g \geq 1$ to access to finance, which is also gender specific. With collateral constraints, an entrepreneur is capital constrained when $k(a,z) = \lambda_g a < k(z)$; that is, the entrepreneur wants to use more capital in production but is unable to borrow adequate capital. Note that $\lambda_g \in [1, \infty)$ maps to levels of financial market development with

[12] Again, for notation ease we use k and n noting these are individual and gender specific based on (z, a).

lower values representing more restricted access to finance. As is typical in these models, taking financial market development as given, high asset entrepreneurs have easier access to finance than low asset entrepreneurs. In this sense, λ_g broadly measures access to finance across gender and a measures access to finance *within* gender. In the extreme case where $\lambda_g = 1$, entrepreneurs cannot borrow from financial intermediaries and access to capital is one-to-one based on their asset holdings; and $\lambda_g = \infty$ represents the unconstrained case with perfect capital markets.

We emphasise two key differences in the model across gender that are consistent with our empirical results in Section 2. First, $\lambda_m > \lambda_f$ implies a male entrepreneur has easier access to finance than a female entrepreneur. An implication is that a higher share of men will select in to entrepreneurship due to higher profit from operating at a more efficient scale, all else equal. As such, this can account for the under-representation of female entrepreneurs and their market shares documented in Section 2.2. In addition, $\lambda_m > \lambda_f$ implies that it takes longer for women to over come financing constraints by self-financing and operate at an efficient scale (i.e., $k_g(a, z) \to k_g(z)$ more slowly for women), and hence account for women operating relatively smaller firms—less capital, workers, output and profit—consistent with our evidence. A second feature that affects entrepreneurship is through $0 < \phi < 1$ in the CES composite labor input. When $\phi < \Lambda_f/(\Lambda_f + \Lambda_m)$, it implies that female workers are less valued in production such that they earn lower wages ($w_f < w_m$). All else equal, lower wages make entrepreneurship more attractive for women, which together with lower access to finance amplifies the share of women that operate small-scale capital constrained firms. As such, λ_m, λ_f and ϕ are key structural parameters that affect male and female entrepreneurship at the extensive and intensive margin, which we explore in-depth in the quantitative analysis.

To be clear, we have assumed common production technologies across gender. Conceptually, differences in inputs used in production across gender, specifically for capital, can be attributed to differences in θ or α across gender, or due to preferences, which we assume away. That is, the primitives of the model related to technology are common across gender where

men and women use the most efficient production technology. Likewise, we assume common preferences for work and business ownership, and attribute all differences in the extensive and intensive margins of entrepreneurship to differences in access to finance (and wages). We note that our empirical findings in Section 2, which account for education, martial status and motivation for operating a business are consistent with these assumptions.

3.2 Occupational choice and Savings

People choose an occupation (worker or entrepreneur) that pays the highest income. Since all firm decisions are intra-period and because there are no irreversibility or adjustment costs, the occupation choice is a static, period-by-period decision. As such, people take their wealth, entrepreneurial ability (a, z) and wages w_g as given, and choose an occupation based on

$$E_g(a, z) = \max\{w_g, \pi_g(a, z)\}, \tag{3}$$

where $\pi_g(a, z)$ is maximized profit based on equation (2). We denote $e_g(a, z)$ as an indicator for a person who is an entrepreneur and $e_g^w(a, z)$ a person who is a worker.

Inter-temporal choice: The dynamic problem faced by individuals in this economy is a variant of the classic income fluctuation problem where they adjust their stock of assets in response to transitory shocks to entrepreneurial ability. Because assets are used as collateral the natural lower bound for assets is zero. We assume $\beta(1 + r) < 1$, where β is a discount factor so that people are relatively impatient. This assumption, together with CRRA utility, ensures there is an upper bound on the desired level of assets, a_{max}.

A person's dynamic program is

$$v_g(a, z) = \max_{c,a'} \left\{ u(c) + \beta \int_{z'} v_g\left(a', z'\right) M_g(z, z'), \right\}, \tag{4}$$

$$\text{s.t.} \quad a' = (1+r)a + E_g(a,z) - c; \qquad a' \geq 0,$$

where $u(c)$ is utility from consumption with the standard assumptions, and $v(a,z)$ is a gender-specific value function.

3.3 Equilibrium

We focus on a stationary equilibrium for this economy which consists of an invariant distribution over assets and productivity $\varphi_g(a,z)$, a set of prices $\{w_f, w_m, r\}$, gender-specific value functions $v_g(a,z)$ and policy functions $\{c_g(a,z), a'_g(a,z),\}$, gender specific entrepreneurial input choices $\{k_g(a,z), n_g(a,z), n_f(a,z), n_m(a,z)\}$ and occupation choices $\{e_g(a,z), e^w_g(a,z)\}$, such that given prices and a stochastic process for productivity $M(z,z')$,

(a) gender specific input choices solve the entrepreneur's problem described in equations (1) and (2), and where $y_g(a,z)$ is optimal production based on these inputs;

(b) occupation choice maximizes current income based on (3) with occupation indicator functions $e_g(a,z)$ and $e^w_g(a,z)$;

(c) gender specific policy functions $c_g(a,z)$ and $a'_g(a,z)$ solve the inter-temporal problem described in (4);

(d) capital market clearing is based on

$$\sum_g \Lambda_g \int_{e_g(a,z)} k_g(a,z)\varphi_g(da,dz) = \sum_g \Lambda_g \int a_g \varphi_g(da,dz) \equiv K;$$

(e) labor market clearing for men is based on

$$\sum_g \Lambda_g \int_{e_g(a,z)} n_m(a,z)\varphi_g(da,dz) \;\; = \Lambda_m \int_{e^w_m(a,z)} \varphi_m(da,dz) \equiv N_m,$$

where the left-hand side shows total male labor demand by male and female en-

trepreneurs, and the right-hand side is the supply of male workers. Similarly, labor market clearing for women is

$$\sum_g \Lambda_g \int_{e_g(a,z)} n_f(a,z)\varphi_g(da,dz) = \Lambda_f \int_{e_f^w(a,z)} \varphi_f(da,dz) \equiv N_f.$$

This formulation also implies aggregate labor market clearing;

(f) goods market clearing is

$$\sum_g \Lambda_g \int c_g(a,z)\varphi_g(da,dz) + \delta K = \sum_g \Lambda_g \int_{e_g(a,z)} y_g(a,z)\varphi_g(da,dz);$$

(g) and lastly, a stationary joint distribution $\varphi_g(a,z)$ induced by saving policies and the stochastic process for idiosyncratic productivity shocks that satisfies;

$$\varphi_g(a,z) = \int \int_{a'(\hat{a},\hat{z})\leq a} \int_{z'\leq z} M(\hat{z},dz')\varphi_g(d\hat{a},d\hat{z}).$$

4 Calibration

We now calibrate the model to replicate important aspects of the Mexican economy, especially with respect to differences across male and female micro-scale business owners. We assume the evolution of ability follows an AR1 process with persistence ρ_z and variance σ_z, and so in total there are 13 parameters to calibrate. We set several of these parameters a-priori and jointly calibrate the remaining parameters to minimize the distance between relevant statistics in the data and those implied by the model.

We again note that while men and women can differ in many respects, our stance is to assume common preferences, distribution of entrepreneurial ability, as well as production technologies across gender. Since our focus is on micro-scale entrepreneurs and because our estimates for gender differences in Section 2 include controls for education and motivation for

starting a business, we think these are reasonable stances to take. Thus, our model economy attributes all differences between men and women to the market frictions considered in this paper: financial frictions (λ's) and entrepreneur preference for workers (ϕ), or discrimination, by gender. This strategy allows us to isolate the importance of these frictions on female entrepreneurship and aggregate outcomes.

We have also abstracted from labor force participation decisions to keep focus on the impacts of financial frictions and wages on female *entrepreneurship*. A labor force entry decision can be included in our setting through differences in disutility from working specific to gender, however, this will have only modest quantitative impacts on the intensive margin of entrepreneurship and on aggregate (Ranasinghe, 2024a). In such a setting, only the lowest ability people forgo working, and so changes in the wage will induce them in to the labor force (i.e., wage work), but not into entrepreneurship which is our focus.

Exogenous parameters. We set nine parameters a-priori. Parameter α is the capital share in production which is set to 1/3 and the depreciation rate is set to 0.08, which are standard values in the literature. For the elasticity of substitution between male and female workers, we set $\sigma = 2.1$ which is the average in the range of values estimated in an extensive micro-literature that examines female labor in production.[13] For preferences, we set the CRRA parameter to 2 and the discount factor $\beta = 0.92$, which are within standard ranges.[14] For the AR1 ability process, and noting that our data is a cross-section absent of a panel dimension, we set $\rho_z = 0.965$ and $\sigma_z = 0.24$. We emphasise these values are within the range of values used in the literature for rich economies, and importantly are consistent with the estimates by Asker et al. (2012) for the AR1 process for Mexico. Of note, when productivity is more persistent the smaller are the impacts from financing frictions from a greater ability to self-finance (Moll, 2014; Midrigan and Xu, 2014) and so our values are fairly conservative

[13] See for instance Chiplunkar and Goldberg (2024), and references therein, who document estimates that range within 1.7–2.3 and use a value similar to ours.

[14] Typically, in these models β is chosen to match the real interest rate in a relatively undistorted economy such as the U.S. (e.g. Buera et al., 2011). However, since we calibrate the model to Mexico, a financially under-developed economy and hence relatively more distorted, we set β a-priori.

in this respect. Lastly, and based on the Census, we set $\Lambda_f = 0.65$ (and normalize the male population share $\Lambda_m = 1$) so that women account for 39 percent of the labor force.

Jointly calibrated parameters. This leaves us with four parameters to jointly determine: the span-of-control parameter (θ), which affects all entrepreneurs independent of gender, and a set of parameters that have a direct gender component across entrepreneurship ($\phi, \lambda_f, \lambda_m$). Even though we jointly calibrate these parameters, each parameter has a more direct impact on a specific moment and so we describe these to motivate our data targets.

For the span-of-control θ, we use the ENOE which is a large employment survey covering the full size distribution of firms, similar to the Current Population Survey in the United States. This parameter affects the overall entrepreneurship rate, which is 22 percent based on the ENOE (excluding agriculture). We also note that while the entrepreneurship rate for men and women are 20 and 25 percent, we assume a common span-of-control across gender to keep consistent with our stance that all differences related entrepreneurship across gender arise from frictions on production rather than differences in production technology.

For the three parameters tied to gender, $\phi \in (0, 1)$ is the female weight on the composite labor input, which we refer to as a female specific labor market discrimination/bias, where values closer to the share of women in the labor force (0.39) generate a smaller gender wage gap.[15] Based on the ENOE, which reports wage income by gender, the gender wage gap is 0.79 in manufacturing and 0.87 in services. Since our findings in Section 2 hold for both manufacturing and services we target a female-to-male wage gap equal to 0.83, a mid-point of manufacturing and services. We note this targeted wage gap is also consistent with our estimated reservation gender wage gap in Table A.4. The remaining parameters are the financing constraints by gender. As these parameters primarily affect access to capital we choose them to match capital shares across gender in the ENAMIN, as well as the share of external finance relative GDP, which we obtain from the World Bank's Financial Development

[15] In our setting, as $\phi \to \Lambda_f/(\Lambda_m + \Lambda_f) = 0.39$, $w_f/w_m \to 1$. If the proportion of men and women are the same, i.e., $\Lambda_f = \Lambda_m$, then $w_f = w_m$ when $\phi = 0.5$.

and Structure Dataset. We apply the former target to the bottom 96 percent of firms in the model to be consistent with the coverage of firms in the ENAMIN, and the latter applies to all firms.

4.1 Model fit

Table 6 reports the model fit along with the parameter values from our joint calibration. The returns to scale parameter is low ($\theta = 0.58$), and is consistent with the range of values used in the literature for poorer economies. For instance, Buera et al. (2021), who also focus on micro-scale firms as we do, calibrate the returns to scale parameter in India to 0.54. The model also implies the weight on female labor is $\phi = 0.31$, which is lower than the value (0.39) needed for wage parity. In this regard, women are viewed as less productive workers, and hence discriminated relative to men. As ϕ is common across entrepreneur gender, this also implies that women entrepreneurs discriminate against female workers.[16] The calibrated values for the collateral constraints are $\lambda_f = 1.43$ and $\lambda_m = 1.83$, implying that male entrepreneurs have about 93 percent greater access to finance than female entrepreneurs. The weighted average of these collateral constraints is $\lambda_{all} = 1.67$ which is the same value Lopez-Martin (2019) finds for all firms in Mexico (1.68), and implies that Mexico as a whole is heavily financially constrained. In this sense, our collateral constraints by gender are consistent with aggregate values for Mexico, and imply that women face more restricted access to finance relative to men.

While we have targeted only four moments in our joint calibration, Table 7 shows that our calibrated model does well matching important non-targeted, gender-focused statistics. For instance, the model replicates quite closely the share of female entrepreneurs. The model also accurately predicts higher entrepreneurship rates for women relative to men. And consistent

[16]The ENAMIN data does not allow us to differentiate gender specific wages paid by male and female entrepreneurs. See for instance Chiplunkar and Goldberg (2024) who allow for this based on their data for India.

Table 6: Model Fit – Targeted Moments

Target Moments	Model	Data	Parameter
Entrepreneurship rate	0.221	0.220	$\theta = 0.583$
Gender wage gap, f/m	0.830	0.830	$\phi = 0.305$
Female share of capital	0.363	0.390	$\lambda_f = 1.43$
External finance to GDP	0.699	0.700	$\lambda_m = 1.83$

Notes: Female market shares in the model are for bottom 96 percent of the firm size distribution of firms.

Table 7: Model Fit – Non-Targeted Moments

Moments	Model	Data
Female share of firms	0.403	0.410
Female entrepreneurship rate	0.225	0.25
Male entrepreneurship rate	0.217	0.200
Average firm size (female/male)	0.900	0.870
Average capital (female/male)	0.839	0.767

Notes: Gender ratios in the model are for bottom 96 percent of the firm size distribution of firms.

with our data, the model predicts that women run smaller firms than men, both in terms of labor and capital.

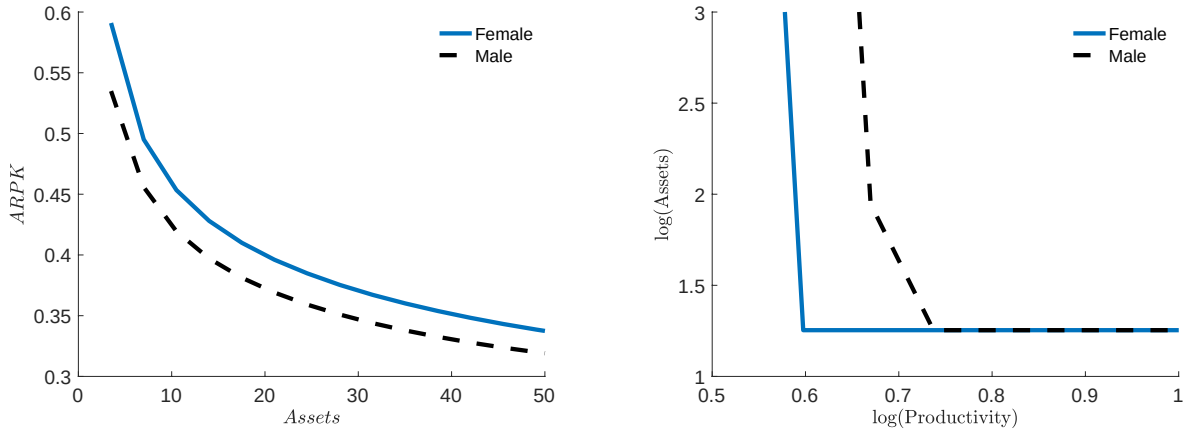
In Table 8, we compare several female/male ratios in our model to their data counterparts. Our model accounts for roughly 15 (46) percent of the mean (median) excess *arpk* found in the data. In terms of profit and output, our model produces gender gaps that are about 20-30 percent of their data counterparts. This shows that while access to finance and labor market discrimination do not account for all of the observed differences, they are nevertheless important determinants of entrepreneurship across gender.

Table 8: Gender Gaps: Model Vs. Data

Gender Gap (Female/Male)	Model (Mean)	Data (Raw mean)	Model (Median)	Data (Conditional median)
arpk	1.08	1.52	1.13	1.28
Profits	0.92	0.56	0.87	0.55
Output/Sales	0.90	0.53	0.88	0.54

Notes: Gender ratios in the model are for bottom 96 percent of the firm size distribution of firms. Conditional medians are calculated as the exponential of the *Female* coefficient in the estimated regressions in section 2.2 using all our controls.

Figure 3: Misallocation of capital and talent across gender



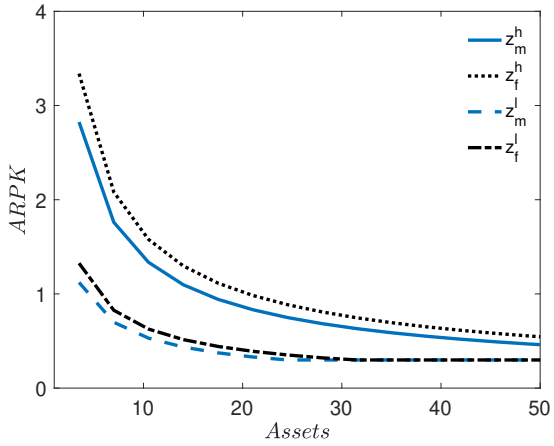
(a) Misallocation of capital

(b) Misallocation of talent

Notes: ARPK is the average across productivity levels.

A key implication of our results is that financial and labor market discrimination creates an inefficient allocation of capital across gender, and also a negative selection effect into entrepreneurship for women relative to men (talent misallocation). In panel (a) of Figure 3, we show that women have a higher *arpk* than men across all asset levels, while panel (b) shows that, for any level of assets, women choose entrepreneurship at much lower ability levels than men. This latter prediction is a unique feature of accounting for female labor market discrimination (through ϕ), as absent of this, a standard model prediction is that women have lower entrepreneurship rates and are more productive on average. Lastly, in Figure 4, we show that women exhibit higher *arpk* across the entire ability distribution (gender based capital misallocation) and where gender differentials are especially evident among high ability-low asset entrepreneurs.

Figure 4: ARPK Differences



Notes: This figure shows the difference in *arpk* for high and low ability entrepreneurs, by gender, across assets. *arpk* gaps shrink as assets increase, and are most noticeable among high productivity entrepreneurs.

5 Results

We now use our model to evaluate the impacts of several counter factual polices that promote female entrepreneurship. We first consider policies that equalize frictions across men and women within the context of our model. We then explore the impacts of additional polices that target firm size and female income.

5.1 Counter-factual policy implications

We use our model economy to evaluate the impacts equalizing access to finance and labor market discrimination on female entrepreneurship and economic aggregates. Table 9 presents the results; column (1) shows the benchmark economy, column (2) considers the case that removes female labor discrimination such that a woman's labor input in production is equally valued as a man's ($\phi = \phi^* \equiv \Lambda_f/(\Lambda_f + \Lambda_m)$), column (3) considers the case when women have equal access to finance ($\lambda_f = \lambda_m$), column (4) removes all forms of frictions across gender, and column (5) explores the impacts when there is an overall increase in access to finance while maintaining differences across gender. Figures 5 and 6 show the corresponding impacts

of these policies on the misallocation of capital and talent, by gender.

As the aggregate impacts of improving access to finance are well understood, we briefly highlight impacts on output and TFP. Table 9 column (2) shows there are modest impacts on aggregates from removing female labor discrimination, and column (3) shows that equalizing access to finance raises output by 1 percent and TFP by 0.6 percent. The impacts on TFP are smaller due to the labor market friction (ϕ) which induce less productive women in to entrepreneurship, thereby lowering TFP gains. Specifically, in a model that abstracts from this labor market friction, equalizing access to finance over predicts TFP gains by a factor of 2 (a 1.1 percent increase instead of 0.6 percent), and especially for smaller increases in access to finance. Overall, the aggregate impacts are small because the economy as a whole is financially constrained; that is, men also face limited access to finance and so improving women's finance to the male level will have modest aggregate impacts. Column (5) shows the effects when access to finance for both men and women are doubled, and consistent with the literature we find larger impacts where output and TFP increase by 5 and 3.6 percent. Again, while these impacts are large they are suppressed by the labor market friction in the model.[17]

Focusing on female entrepreneurship, which is less well understood, we find large impacts on their firm performance, both in regards to the misallocation of capital and talent. In column (2) which removes female labor bias, the relative difference in the gender profit gap narrows to 0.97 (from 0.89 in the benchmark economy).[18] However, this is driven by a higher entry threshold for female entrepreneurship as women now have a higher outside option (Figure 6, panel a); the relative wage gap moves from 0.83 to 0.99. Since the average ability of female entrepreneurs rise, these women require more capital and are thus more financially constrained—*arpk* differences and its variation rise (see also Figure 5, panel a).

[17] Abstracting from gender labor market frictions in this scenario results in an over prediction of TFP gains (4.7 percent instead of 3.6).

[18] We focus on the profit gap and note similar qualitative results for relative differences in firm size and output in our counter-factual policies.

Table 9: Counter-factual policy on aggregate outcomes

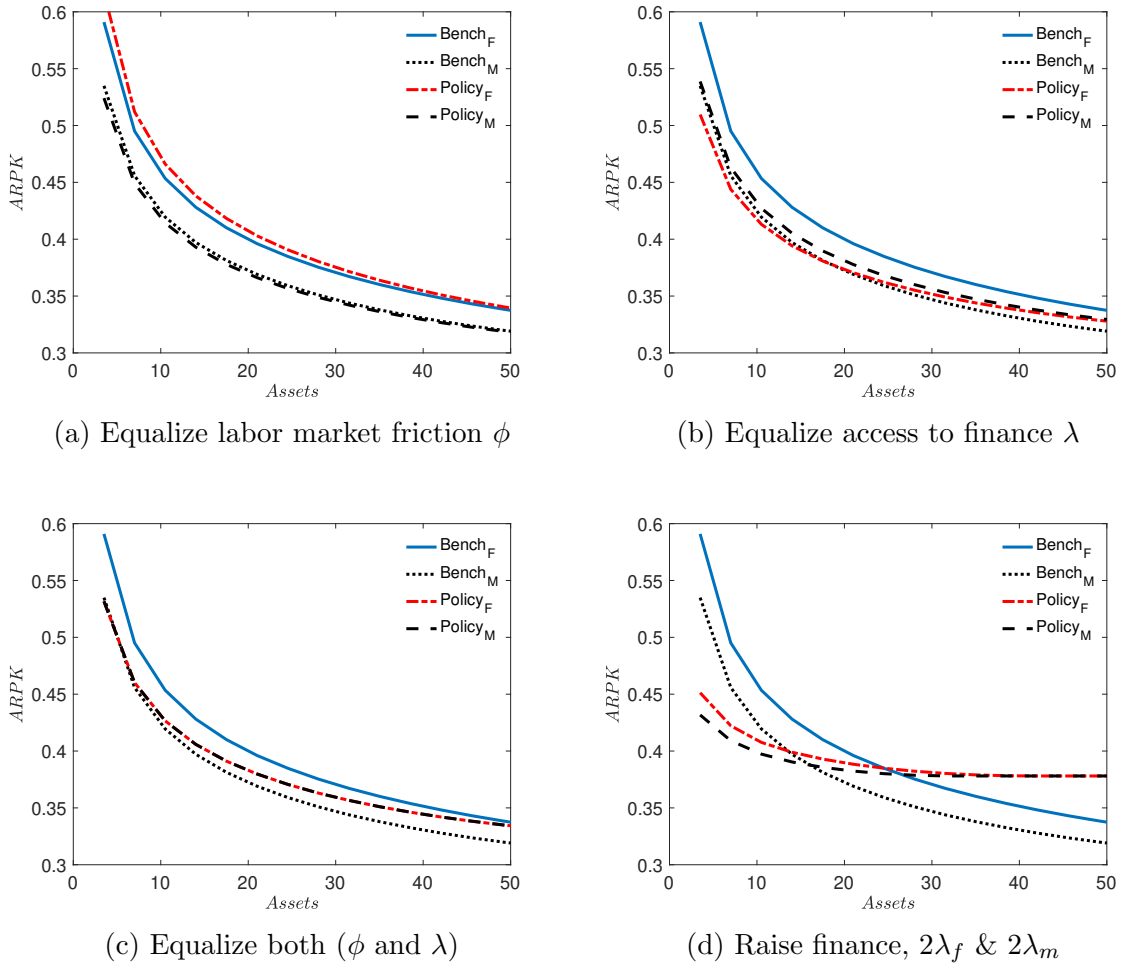
	(1)	(2)	(3)	(4)	(5)
			Equalize		Raise
	Benchmark Economy	Labor $\phi = \phi^*$	Finance $\lambda_f = \lambda_m$	Both $\phi = \phi^*$ & $\lambda_f = \lambda_m$	Finance $2\lambda_f$ & $2\lambda_m$
Output	1.000	1.003	1.011	1.014	1.050
TFP	1.000	1.005	1.006	1.016	1.036
Averages (female/male):					
Firm size	0.88	0.94	0.95	1.00	0.92
Profit	0.89	0.97	0.94	1.00	0.93
arpk, mean	1.08	1.17	0.94	1.00	1.04
arpk, std. dev	1.23	1.24	0.98	1.00	1.28
Wage gap (w_f/w_m)	0.83	0.99	0.83	1.00	0.84
Female consumption					
per entrepreneur	1.000	1.058	1.052	1.071	1.069
per worker	1.000	1.128	1.035	1.155	1.110
Male consumption					
per entrepreneur	1.000	0.970	1.001	0.953	1.026
per worker	1.000	0.950	1.019	0.962	1.083

The threshold for male entry falls and together with equilibrium effects men have lower *arpk*. As such, a policy that removes labor market discrimination has a large impact on female welfare; on a per capita basis, female worker consumption rises by 13 percent and female entrepreneur consumption by 6 percent. In contrast, male worker and entrepreneur consumption fall by 5 and 3 percent.

In column (3), when female access to finance is equalized and ϕ is held at the benchmark level, female entrepreneurs are less constrained and their firm performance improves. There are several forces that drive these results. First, the entry threshold for entrepreneurship rises for men and women, but less so for women because of their lower wages (Figure 6, panel b). An indirect effect of improving female access to finance is a displacement of male entrepreneurs, although on average their consumption rises.[19] A consequence is that male entrepreneur *arpk* rises due to the higher entry threshold (and higher prices), whereas female entrepreneur *arpk* falls as improved access to finance dominates impacts from lower entry. As such, men are now more constrained across the distribution (Figure 5, panel b), and the

[19]Higher wages raise worker consumption, and despite higher equilibrium prices entrepreneur consumption rises because they have higher ability on average.

Figure 5: Policy impacts on misallocation of capital across gender



(a) Equalize labor market friction ϕ

(b) Equalize access to finance λ

(c) Equalize both (ϕ and λ)

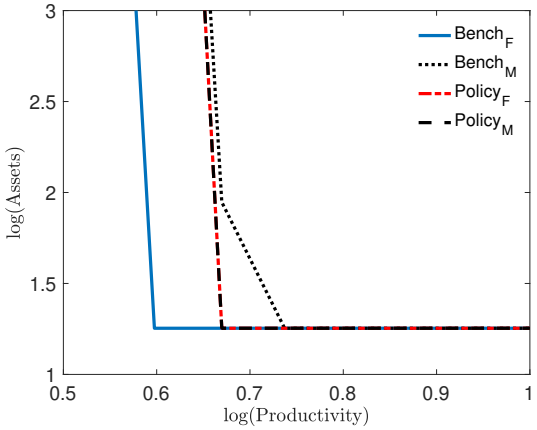
(d) Raise finance, $2\lambda_f$ & $2\lambda_m$

Notes: Plotted is *arpk* based on the average ability for each level of assets, by gender.

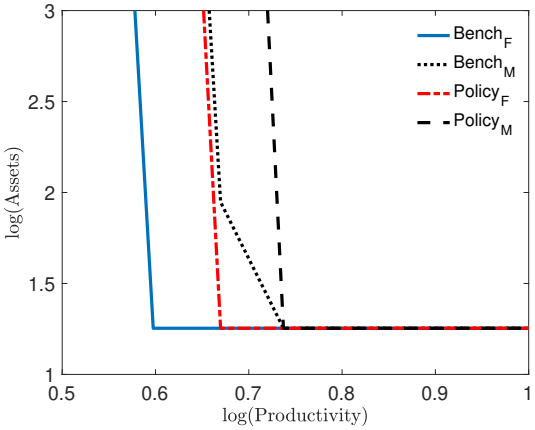
relative mean and volatility of *arpk* falls below 1. Again, we note the importance of labor market discrimination against women, as without it the model would imply the same *arpk* and entry threshold across gender. Overall, relative firm size and profit differences narrow to 0.95 implying that women operate larger firms from improved access to finance. The impacts from equalizing finance on female consumption are positive but they are smaller than when labor market discrimination are equalized, especially for workers.

In column (4), we show that when all frictions are removed there is full convergence in male and female firm outcomes and the wages they earn. Lastly, column (5) shows the impact

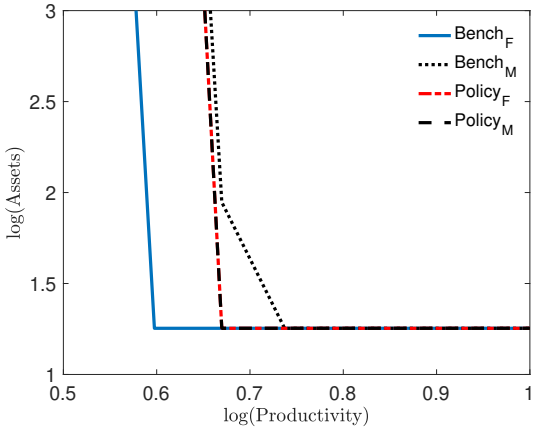
Figure 6: Policy impacts on misallocation of talent across gender



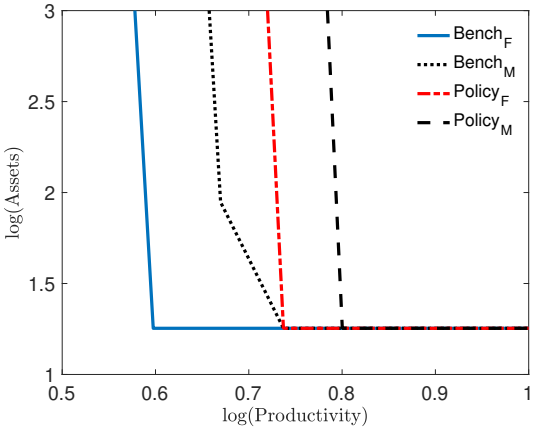
(a) Equalize labor market friction ϕ



(b) Equalize access to finance λ



(c) Equalize both (ϕ and λ)



(d) Raise finance, $2\lambda_f$ & $2\lambda_m$

of doubling access to finance relative to each gender's baseline while keeping ϕ fixed—in essence, a policy that uniformly improves access to finance in Mexico. Here, while female access to finance doubles, the *level* gap in access to finance across gender widens. We find that *arpk* falls and the gap across gender shrinks (Figure 5 panel d). And since the share of constrained entrepreneurs fall and equilibrium prices rise, the entrepreneurship rate falls (Figure 6, panel d). Overall, profit gaps narrow but not to the same extent as in column (3); likewise, while female to male *arpk* gaps narrow relative to the benchmark, it is not to the same extent as column (3). From a policy perspective, even though male-female gaps narrow

more sharply under modest increases in finance, column (5) shows that larger improvements in finance generate larger impacts on output and TFP. In addition, it raises male and female worker consumption by 8 and 11 percent, and male and female entrepreneur consumption 2.6 an 7 percent.

A key point of our analysis is that evaluating differences in firm performance across gender needs to be understood within the context of women facing both labor market barriers and limited access to finance. As we have shown, accounting for female labor discrimination imply much larger gaps in male-female firm performance, and smaller aggregate gains from improving female access to finance when women have weak outside options. Second, even though equalizing access to finance (column 3) has larger impacts on output and TFP than a policy that removes labor bias, our results show that improving women's labor market outcomes generate much larger impacts on female welfare as measured by consumption. In this regard, we view policies that improve female labor market prospects as of first-order importance improving women's economic outcomes. However, such a policy lowers consumption for both male workers and entrepreneurs, and is likely to face heavy resistance. Third, large uniform improvements in access to finance (as in column 5) can generate substantial impacts on female consumption, even though it widens the level gap in differential access to finance. A take away is that improving access to finance independent of gender, rather than attempts to equalize access to finance across gender, should take precedence for development, both on aggregate and as well as for female welfare.

5.2 Alternate policies

We now consider the impacts of two additional policies on female entrepreneurship and aggregate outcomes: (i) distortions that rise with firm size, and (ii) female targeted income subsidies. Our motivation for considering these policies are that equalizing access to finance and/or removing labor market discrimination may not be feasible—they require fundamental

changes to social views and cultural practices, which can be resistant to change. Instead, the hypothetical polices we consider can be thought of as being implemented by the government reasonably quickly.

5.2.1 Size Dependent Distortions

It has been well documented in the misallocation literature that larger firms face higher distortions on production, and is a feature that is especially prevalent in poorer countries (Guner et al., 2008; Restuccia and Rogerson, 2017). In contrast, the financial frictions in our model mostly affect small, high productivity firms. We now add size dependent distortions that rise with firm size to our model to evaluate their impacts on female entrepreneurship and on aggregate. We follow the approach in Qian and Vereshchagina (2024), who show that distortions that rise with firm size can redirect resources from larger firms to smaller financially constrained firms, and thereby improve aggregate outcomes. Our aim is to evaluate the impacts of such size dependent distortions with a particular focus on female entrepreneurship; in that, whether these size distortions mitigate the impacts on financially constrained female firms, as well as its aggregate implications.

As in Qian and Vereshchagina (2024) we consider a proportional tax on output that rises with quantity produced, i.e., a size dependent distortion, $T(y) = 1 - \xi y^{-\tau}$, $\xi \geq 1, \tau \geq 0$, noting this is a standard tax function that has been used in the literature. We assume this size distortion $T(y)$ is imposed by the government on all firms independent of gender. The distortion can be thought of as an explicit tax on output to more implicit costs, such as excessive regulatory burden, that encumber larger firms. As before, women face lower access to finance ($\lambda_f < \lambda_m$) and labor market discrimination ($\phi < \phi^*$), but we now add size dependent distortions.[20] When $\tau = 0$ and $\xi = 1$, it corresponds to the case where there are no size dependent distortions, and as τ increases the severity of the size distortion rises. For

[20]Our model setup is the same as in Section 3 except that output in equation 2 is now $(1 - T(y))y = \xi y^{1-\tau}$ to reflect distortions that rise with firm size.

each τ that we consider, ξ is chosen to ensure the policy is revenue neutral—smaller firms receive subsidies and larger firms face taxes such that on net, total taxes collected sum to zero.

Figure 7 shows the impacts on variables of interest when we raise τ from 0 to 20 percent, and where for this range of τ the average subsidy (tax) on female (male) entrepreneurs is between 0 to 6.5 (0 to 4.9) percent.[21] Panel (a) shows aggregate outcomes, average *arpk* and profit gaps (female to male), relative to the benchmark economy. Aggregate output initially rises, is above 1 percent higher when $\tau \in (0.04, 0.10)$, and falls below the benchmark as taxes become too large (when τ is over 0.15); TFP is close to seven percent higher relative to the benchmark when output is at its peak.[22] We also note that the impacts when $\tau \approx 0.10$, roughly where women (men) on average receive a 4 (3) percent subsidy (tax), are quantitatively equivalent to a policy that equalizes access to finance and labor market discrimination (Table 9, column (4)).

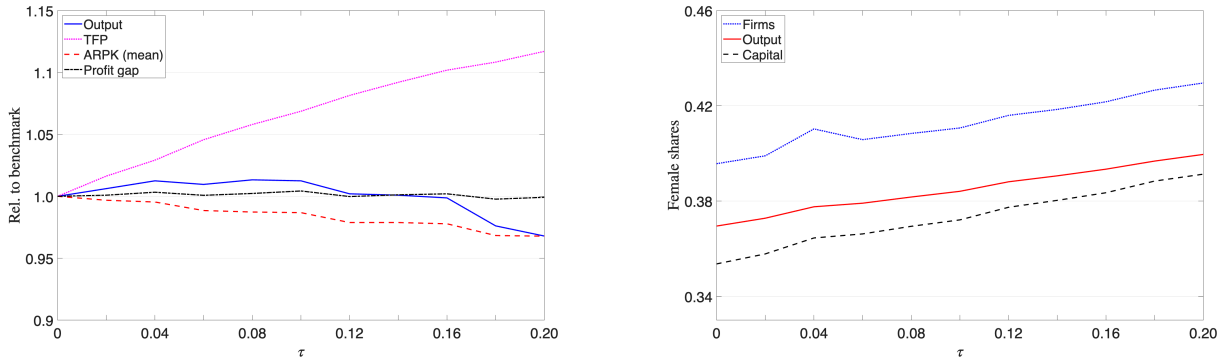
Focusing on the misallocation effects across gender, we find that female to male ratios of mean *arpk* decreases as τ rises. That is, as distortions rise with firm size, larger unconstrained firms (mostly male) shrink and smaller constrained firms (mostly female) expand, such that female firm misallocation falls relative to the benchmark (although women owned firms still have a higher mean *arpk* compared to men for each τ considered). Despite this, the female to male profit gap remains constant. When women face labor market discrimination, subsidizing small firms generates a disproportional influx of low productivity women in to entrepreneurship which negates the profit gains achieved by incumbent female entrepreneurs.[23] This entry into entrepreneurship is shown in Figure 7 panel (b), where a clear pattern is that female

[21] While women on average receive subsidies, large female owned firms pay taxes as this tax policy is specific to firm output, not gender. In addition, the variation in taxes across firms will vary with τ; for example, when $\tau = 0.10$, where aggregate output gains are highest, taxes range from -29.7 to 11.1 percent.

[22] These patterns are qualitatively similar to Qian and Vereshchagina (2024) who calibrate their model to Denmark, but smaller in magnitude for output because our returns to scale parameter for firms in Mexico is much smaller.

[23] Likewise, the impacts on average firm size differences are modest due to these offsetting effects. Higher distortions, which mostly affect male firms, imply a narrowing of average firm size gaps, however, an increase female entry in to entrepreneurship widens this gap, which on net moslty cancels out.

Figure 7: Size Dependent Distortions on Female Entrepreneurship



(a) Aggregates and Misallocation

(b) Female Market Shares

Notes: Panel (a) shows the impacts on aggregate output, TFP, average *arpk* and profit gap (female to males) as τ is increased. Panel (b) shows the impacts on female market shares, specifically the share of female entrepreneurs, their output and capital.

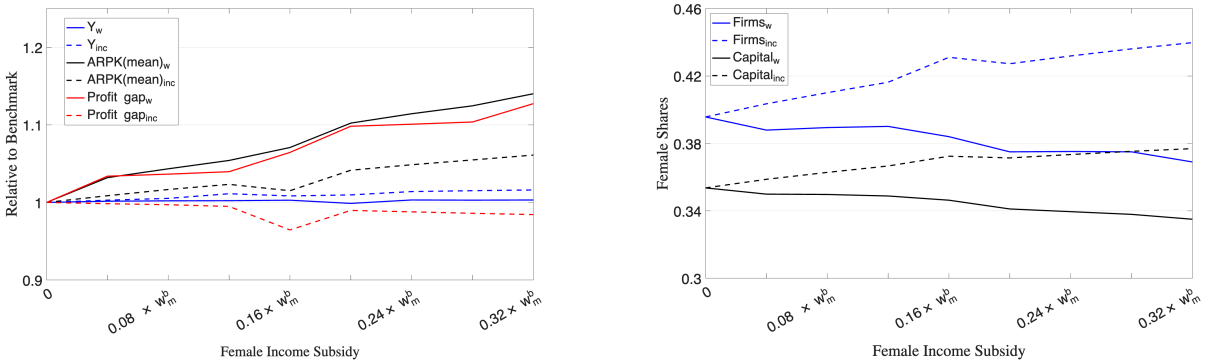
market shares rise with τ (whether measured by share of firms, output or inputs).

Overall, we find that size dependent distortions can be an effective tool to mitigate some of the aggregate losses driven by differential access to finance. However, they may not be an effective tool at decreasing earnings inequality, as it induces selection into entrepreneurship at the lower end of the productivity distribution, where women are over represented due to their lower wages relative to men. In other words, our results are a mix of improved intensive-margin allocation of capital, but worsened selection. When $\tau = 0.1$ the intensive-margin effect dominates, which results in a positive, albeit modest, aggregate effect.

5.2.2 Targeted income subsidies

We now consider two variants of a targeted income subsidy specific to women: (a) female *workers* receive an income subsidy in addition to their market wage, and (b) all women, irrespective of occupation, receive an income subsidy in addition to their market earnings (wages or profit). We note this latter policy is similar in spirit to the female-targeted transfer

Figure 8: Female Income Subsidies



(a) Aggregates and Misallocation

(b) Female Market Shares

Notes: The subscripts refer to subsidies applied to female workers ($_w$) and all women ($_{inc}$). $ARPK$(f/m) refers to average firm $arpk$ of female firms relative to male firms, and similarly for profit. Panel (b) reports the female share of all firms and all capital.

program "Pensión para Mujeres Bienestar" implemented in Mexico in the year 2025.[24] To simplify our analysis, we assume these income subsidies are financed as a lump sum tax; for consistency with our previous figures we report aggregate output and verify that our results are qualitatively consistent for TFP and consumption net of taxes (for welfare). In addition, we assume these income subsidies apply only to women already in the labor force to abstract from female labor force entry as a result of these subsidies.[25]

Figure 8 shows the impacts of these two schemes when the female subsidy is equal to a proportion of the male wage in the benchmark economy (w_m^b). The gender wage gap, accounting for the income subsidy, reaches parity when the subsidy is around $0.16 \times w_m^b$ under both scenarios. Panel (a) shows that both income subsidies raise output in the range of 1 percent and is largest when applied to all women. For context, when applied to all women the subsidy equal to $0.24 \times w_m^b$ generates the same quantitative impacts on output and TFP as the policy

[24]This transfer program is officially aimed at reducing gender inequality, and targets women aged 60-64. Age and gender are the only prerequisites to register for the program, which awards its beneficiaries 3,000 pesos every two months. This amount is equivalent to approximately 11 days of minimum wage.

[25]Income subsidies will raise female labor force participation, however, this will have modest impacts on female entrepreneurship in our quantitative model, which is our focus.

that equalizes access to finance and labor distortions (in Table 7 column 4).[26] The cost of this subsidy is about 5 percent of output, and in this regard is the implicit cost to achieve the aggregate effects implied by a policy that equalizes access to finance and labor market frictions.

While the impact of both subsidies are to raise output, they have sharp differences on female entrepreneurship. As shown in panel (b), a policy that subsidies only female workers lowers the share of female firms and their share of capital (as well as output and labor), whereas an income subsidy that applies to all women has the opposite effect. The intuition is that wage subsidies raise female worker wages undoing some their labor market discrimination, whereas a subsidy that applies to all women encourages women in to entrepreneurship. As a consequence, the wage subsidy raises the average productivity of female entrepreneurs (lower productivity women exit entrepreneurship) and the subsidy to all women lowers average productivity (more low productivity women enter in to entrepreneurship). Consistent with this reasoning, the profit gap narrows under a policy that subsidises female workers and widens when all women are subsidized.

Of note, under both subsidy plans women become more financially constrained relative to men (based on *arpk*), and to a larger extent under the wage subsidy (panel a). This is because under the wage subsidy low productivity and low financially constrained women exit entrepreneurship which raises average *arpk* levels. In contrast, when all women are subsidized the initial drop in *arpk* among incumbents is offset by financially constrained women entering into entrepreneurship. In this sense, an income subsidy to all women lessens female financial constraints among incumbents, although the indirect effects from entry and exit can offset these gains. Again, our results here highlight the importance of accounting for both labor market and entrepreneurial frictions for better understanding the impacts of these policies on female outcomes.

[26] Consumption net of taxes rises relative to the benchmark but to match consumption in the economy that equalizes finance and labor market frictions requires a higher subsidy ($0.32 \times w_m^b$).

6 Conclusion

Using a unique dataset on micro-scale firms in Mexico, we document that women owned businesses under-perform and receive less financing compared to male owned firms. That is, even among the smallest firms where barriers to entry are likely small and where women are heavily represented, women experience severe constraints in operating their business. Notably, these gaps are apparent despite accounting for differences in entrepreneur commitment, days worked, education and marital status, important factors that influence the intensive and extensive margins of female entrepreneurship. We evaluate the quantitative importance of these forces in a model that accounts for the inter-play of gender based discrimination in both labor and financial markets, in line with our evidence.

Our findings show that understanding gender inequality in entrepreneurial earnings requires recognizing not only the barriers faced by women-owned firms but also the negative selection effects created by gender discrimination in wage employment. A central insight is that labor-market discrimination dampens the benefits of expanding women's access to finance and, more broadly, of financial development. We further demonstrate that no targeted policy is a substitute for broad financial deepening. Expanding access to finance for *all* entrepreneurs—regardless of gender—substantially reduces gender inequality and delivers aggregate output gains far surpassing those of gender-specific interventions or size-based tax and subsidy policies.

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A Appendix

A.1 Variable construction using the Enamin

The control variables in the regression tables in Section 2 are constructed as follows. Industry is an indicator variable for whether the firm operates in manufacturing, services, construction or trade. Entrepreneur traits control for experience (years an entrepreneur has operated the business, 0, $1-4$, $5-9$, $10-19$ and >20), education level completed (none, elementary, lower-middle school, upper-middle school, professional and graduate), age, and marital status (equal to one if married or common-law). Controls for firm size include whether the firm operates from a physical location, and indicators for formality status. For the latter, we use indicators for whether the firm is registered (3% of firms), keeps official accounts (22% of firms) and issues receipts (19% of firms); and 28% (1.6%)of firms report doing at least one (none) of these three.

Controls for motivation include average days worked in a week by the owner to measure for how committed to the business an owner is (80% report working at least five days per week), as well as indicators for whether the business was started due to not having outside options (if the owner says it is the only way to make money, no job experience, no schooling, other jobs pay too little, or no job opportunities), due to standard motivations (tradition, to supplement income, or over-trained), as a side-job (need flexible schedule or other reasons), or due to entrepreneurial spirit (to increase income, found a great opportunity, it is a passion) which we refer to as a serious/committed entrepreneur. In the data, 17% of firms are classified as not having outside options, 28% due to standard motivations, 12% as a side business, and 43% as serious.

A.2 WBES size distribution

Table A.1: Descriptive Statistics across size distribution of formal firms (based on WBES)

	Panel A $n<10$		Panel B $n<20$		Panel C $n<50$		Panel D $n<100$		Panel E All firms	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
# of firms (unweighted)	95	55	203	93	322	144	410	180	587	210
Market shares										
share of entrepreneurs	0.69	0.31	0.80	0.20	0.80	0.20	0.80	0.20	0.80	0.20
share of sales	0.69	0.31	0.74	0.26	0.78	0.22	0.82	0.18	0.92	0.08
share of capital	0.64	0.36	0.72	0.28	0.72	0.28	0.75	0.25	0.88	0.12
share of workers	0.68	0.32	0.83	0.17	0.81	0.19	0.81	0.19	0.86	0.14
Averages:										
firm size (ln)	1.75	1.79	2.20	1.96	2.45	2.29	2.61	2.46	2.94	2.67

Notes: Statistics are based on the WBES 2010 for Mexico and weighted. A firm is defined as female owned if any one of the owners is female. The results are similar to when using top manager to define business owner gender.

A.3 Additional empirical results

Below we report results when measuring capital distortions, $1 + \tau_k$, based on the inverse of the capital to labor ratio (Table A.2). For sake consistency in the sensitivity tests below, we report estimates for $1+\tau_k$ for all firms, and also verify that the estimates hold when excluding self-employed firms. We also report estimates for firms in the service sector (Table A.3), and reservation wages (Table A.4).

Table A.2: Capital distortions based on $1 + \tau_k$ by entrepreneur gender

	(1)	(2)	(3)	(4)
Female	1.14***	0.95***	0.85***	0.80***
	(0.04)	(0.04)	(0.04)	(0.04)
Controls:				
Industry	✓	✓	✓	✓
Entrepreneur traits	–	✓	✓	✓
Size	–	–	✓	✓
Motivation	–	–	–	✓
N	13060	12373	12373	12061
R^2	0.085	0.180	0.267	0.274

Notes: See text for details. Industry controls for service, manufacturing, trade or construction; Entrepreneur traits control for education, experience, age and marital status; Size controls for whether the firm has a physical location, and indicators for whether the firm is registered, has formal accounts and issues receipts; and Motivation controls for reasons for starting a business and days worked. Standard errors are in parenthesis and ***, **, * denote significance at the 1, 5 and 10 percent level.

Table A.3: Estimates for firms in the service sector

	(1) Sales	(2) Capital	(3) Profit	(4) $arpk$	(5) $1 + \tau_k$
Female	-0.298***	-0.721***	-0.386***	0.415***	0.715***
	(0.035)	(0.051)	(0.028)	(0.054)	(0.051)
N	5025	5304	5073	5025	5304
R^2	0.294	0.329	0.346	0.101	0.281

Notes: See text for details. All estimates include controls based on Table 2, column 4.

A.4 Sensitivity tests for empirical results

In Section 2.3 we present a variety of sensitivity tests. Below we report results related to focusing on education, serious entrepreneurs, whether they operate from a physical store and whether they are married (we show results for women and across gender).

Table A.4: Reservation wage by entrepreneur gender

	(1)	(2)	(3)	(4)
Female	-0.416***	-0.346***	-0.313***	-0.293***
	(0.016)	(0.014)	(0.014)	(0.015)
Controls :				
Industry	✓	✓	✓	✓
Entrepreneur traits	–	✓	✓	✓
Size	–	–	✓	✓
Motivation	–	–	–	✓
N	8371	7923	7923	7693
R^2	0.099	0.327	0.385	0.394

Notes: Estimates for each column are based on the controls in Table 2.

Table A.5: Highly Educated with sample restricted to women

	(1) Sales	(2) Capital	(3) Profit	(4) $arpk$	(5) $1+\tau_k$
High-ed	0.30***	0.66***	0.35***	-0.40***	-0.70***
	(0.04)	(0.07)	(0.04)	(0.07)	(0.07)
N	5012	5247	5003	5012	5247
R^2	0.249	0.308	0.256	0.105	0.266

Notes: See text for details. All estimates include controls based on Table 2, column 4.

Table A.6: Estimates when sample restricted to highly educated

	(1) Sales	(2) Capital	(3) Profit	(4) $arpk$	(5) $1+\tau_k$
Female	-0.42***	-0.29***	-0.40***	-0.14	0.16*
	(0.06)	(0.08)	(0.05)	(0.09)	(0.08)
N	1720	1884	1750	1720	1884
R^2	0.295	0.249	0.278	0.089	0.154

Notes: See text for details. All estimates include controls based on Table 2, column 4.

Table A.7: Serious entrepreneurs with sample restricted to women

	(1) Sales	(2) Capital	(3) Profit	(4) *arpk*	(5) $1+\tau_k$
Serious	0.01	0.24***	0.11***	-0.22***	-0.26***
	(0.04)	(0.06)	(0.03)	(0.06)	(0.06)
N	4642	4851	4630	4642	4851
R^2	0.257	0.320	0.268	0.107	0.282

Notes: See text for details. Serious refers to an entrepreneur defined as 'gungho' (to increase income, found an opportunity, or for passion). All estimates include controls based on Table 2, column 4.

Table A.8: Estimates when sample restricted to serious entrepreneurs

	(1) Sales	(2) Capital	(3) Profit	(4) *arpk*	(5) $1+\tau_k$
Female	-0.65***	-0.73***	-0.57***	0.09	0.68***
	(0.04)	(0.06)	(0.03)	(0.06)	(0.06)
N	4860	5138	4917	4860	5138
R^2	0.301	0.316	0.334	0.114	0.256

Notes: See text for details. All estimates include controls based on Table 2, column 4.

Table A.9: Entrepreneurs that operate from a store with sample restricted to women

	(1) Sales	(2) Capital	(3) Profit	(4) *arpk*	(5) $1+\tau_k$
Physical Store	0.39***	1.38***	0.25***	-1.00***	-1.23***
	(0.04)	(0.06)	(0.03)	(0.06)	(0.06)
N	4642	4851	4630	4642	4851
R^2	0.257	0.320	0.269	0.108	0.283

Notes: See text for details. All estimates include controls based on Table 2, column 4.

Table A.10: Estimates when sample restricted to entrepreneurs that operate from a store

	(1) Sales	(2) Capital	(3) Profit	(4) $arpk$	(5) $1+\tau_k$
Female	-0.38***	-0.39***	-0.41***	0.01	0.31***
	(0.04)	(0.05)	(0.03)	(0.06)	(0.05)
N	4401	4718	4427	4401	4718
R^2	0.259	0.223	0.325	0.036	0.162

Notes: See text for details. All estimates include controls based on Table 2, column 4.

Table A.11: Estimates for married entrepreneurs with sample restricted to women

	(1) Sales	(2) Capital	(3) Profit	(4) $arpk$	(5) $1+\tau_k$
Married	-0.04	0.06	-0.10***	-0.08	0.03
	(0.04)	(0.05)	(0.03)	(0.05)	(0.05)
N	4642	4851	4630	5012	4851
R^2	0.257	0.320	0.269	0.099	0.283

Notes: See text for details. All estimates include controls based on Table 2, column 4. The estimates for sales are negative and statsitically significant when not including controls for 'motivation'.

Table A.12: Female estimates when the sample is restricted to married entrepreneurs

	(1) Sales	(2) Capital	(3) Profit	(4) $arpk$	(5) $1+\tau_k$
Female	-0.73***	-0.94***	-0.71***	0.22***	0.87***
	(0.03)	(0.05)	(0.02)	(0.05)	(0.04)
N	8392	8863	8509	8392	8863
R^2	0.317	0.326	0.376	0.099	0.270

Notes: See text for details. All estimates include controls based on Table 2, column 4.

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