

# PROMOTING WOMEN ENTREPRENEURS IN MEXICO





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# INTRODUCTION

**This report presents the results of various experimental studies that try to address, from different perspectives, the challenges of supporting the growth and profitability of women entrepreneurs.** This is especially relevant in the Mexican context as the country has one of the lowest rates of female labor force participation in the Latin America and the Caribbean region, at 44 percent, as well as one of the largest gender gaps in labor market participation in the region (after Guatemala and Honduras). At the same time, self-employment and microentrepreneurship together represent the second most important type of employment (13.5 percent of the employed population), and women account for 51 percent of the entrepreneurs in the country.<sup>1</sup>

**Furthermore, in Mexico, women tend to be overrepresented in the category of microentrepreneurs, who often have limited access to productive resources and networks.** Women entrepreneurs are also concentrated in a few economic activities, and over 70 percent of their entrepreneurial activity is in wholesale or retail (Elam et al. 2019). It is thus a priority to clearly understand the challenges women entrepreneurs face at different levels, ranging from smaller microentrepreneurs to high-end, high-impact entrepreneurs.

**The report is the result of various partnerships and collaboration with the government of Mexico,** such as the Consejo Nacional de Evaluación de la Política de Desarrollo Social (National Council for the Evaluation of Social Development Policy, CONEVAL), the Secretaría de Hacienda y Crédito Público (Secretariat of Finance and Public Credit), the Secretaría de Economía, the Instituto Nacional del Emprendedor (National Institute of the Entrepreneur), which has been replaced by the Unidad de Desarrollo Productivo (Productive Development Unit, UDP), as well as with external nongovernmental organizations (NGOs), such as CREA (Crea Comunidades de Emprendedores Sociales, Create communities of social entrepreneurs) and FUNDES (a consultancy firm that specializes in the development of small and medium enterprises [SMEs]), and external researchers at various universities (Columbia, Massachusetts Institute of Technology, Stanford, University of Texas–Austin).

**The report addresses two fundamental issues. First, it addresses the issue of how to improve performance and profitability.** For this purpose, it presents the results

of two rigorous impact evaluations of two alternative approaches. One approach is a novel training intervention relying on soft skills (personal initiative), in addition to traditional hard skills (business literacy skills). The second approach is an intervention relying on low-cost consulting. Both interventions target entrepreneurs and businesses that are similar in their economic activities, but the businesses supported by the consulting pilot project appear to be somewhat bigger in terms of paid employees (two paid employees on average versus one in the training pilot) and sales. In terms of costs, the training program cost was about US\$270 per entrepreneur, while the cost of the consulting intervention was US\$675 per entrepreneur.

**For each one of these interventions, the report examines their cost-effectiveness and return on investment (ROI). Both programs exhibit high ROI.** Given the costs of the programs, the study estimates that a positive ROI can be achieved (that is, the program costs can be paid back through the benefits in terms of extra profits) in less than a year in both programs. What program should the government prioritize? The returns to both programs are similar.

**Based on the findings, this report concludes that both programs should be available as part of a larger portfolio of interventions to support women with small enterprises.** Given the sample size of the training pilot project, the study is also able to identify specific characteristics that might be targeted to increase the effectiveness of the programs. The findings suggest that, to maximize the impact of the programs, it would be appropriate to target women's enterprises that are more formal, while also targeting smaller and less profitable ones.

**The second issue addressed in the report focuses on the drivers and the implications of sectoral barriers to women entrepreneurs.** This issue is addressed both for women microentrepreneurs, in chapter 3, as well as larger enterprises with high-growth potential, in chapter 4. The main results are two. First, there are significant returns available in terms of profits, sales, and employment for women entrepreneurs who manage to cross over and break the sectoral barriers. Second, the study identifies three main factors that significantly increase the capacity of women entrepreneurs to cross

<sup>1</sup> 2012 data of ENAMIN (Encuesta Nacional de Micronegocios, National Survey of Microenterprises) (database), National Institute of Statistics and Geography, Aguascalientes, Mexico, <https://www.inegi.org.mx/programas/enamin/2012/?ps=microdatos>.



over successfully: education (especially science-related degrees among high-impact women entrepreneurs), cognitive skills, and access to mentoring or role modeling broadly and, specifically, among high-growth enterprises among women who have worked in family enterprises.

**While this report advances our knowledge about programs and ideas that may be key in supporting women entrepreneurs, there are significant areas of research that could not be addressed here.** First, understanding better what interventions might support women entrepreneurs in crossing over and breaking the sectoral barriers would not only increase profitability among women entrepreneurs, but also improve allocative efficiency. Second, the analysis was not able to assess whether a composite intervention that includes training and consulting support (one-on-one or in groups) would have an impact that is greater than the sum of the two individual interventions separately. Third, evaluating a scaled-up version of these pilot projects by increasing the number of beneficiaries by 10 or 20 times would also provide more information about the potential spillover effects of the programs. These questions are crucial for policy makers looking for solutions to promote gender equity and overall productivity at the same time through less misallocation.

**The report is divided into four main chapters, each describing a different evaluation.** The first chapter presents the results of a rigorous impact evaluation of a novel entrepreneurial training program to promote growth and profitability among woman-led businesses. The main novelty of this pilot approach is that it complements a traditional business training program with modules centered on soft skills (that is, personal initiative) that have proven successful in different contexts. The second chapter presents the results of an innovative pilot project that delivered consulting services to retailers in Mexico City through a cost-effective, hands-on approach and discusses the extent to which women entrepreneurs have benefited differently from this program. The third chapter focuses on microentrepreneurs and presents results from a study assessing the benefits and determinants among women entrepreneurs who break sectoral barriers and enter in what may be defined as man-dominated sectors. The fourth chapter focuses on high-impact or high-growth entrepreneurs and assesses the differences between the characteristics and the performance of woman- and man-led firms. The chapter relies on both administrative and survey data. Each chapter concludes with specific lessons and policy recommendations for policy makers.









# CHAPTER 1.

# SOFT SKILLS TRAINING

# BUNDLED WITH HARD

# MANAGERIAL SKILLS

## INTRODUCTION

**This chapter presents the results of a rigorous impact evaluation of a novel entrepreneurial training program to promote growth and profitability among woman-led businesses.** The program represents a partnership with the government of Mexico that was responsible for the program's funding and evaluation through the Secretaría de Economía and for funding part of the data collection through the Consejo Nacional de Evaluación de la Política de Desarrollo Social (National Council for the Evaluation of Social Development Policy, CONEVAL).

**The novelties and contributions of this pilot project are many.** First, the pilot goes beyond previous entrepreneurial training programs by incorporating a module on soft skills (that is, personal initiative) to complement the more traditional hard skills training that focuses on business skills and literacy (for example, costing, pricing, and marketing). Second, its size is significantly larger than previous pilot projects and allows an assessment with more detail on the question of the existence of impact heterogeneity across different entrepreneurs.

The chapter is divided into five sections. First, it presents a literature review. Second, it describes the intervention in detail. Third, it provides information on the beneficiary. Fourth, it presents the methodology and results of the impact evaluation. Fifth, it concludes by discussing cost-effectiveness and the returns on investment (ROIs) of the program.

## LITERATURE REVIEW

**Business training has been widely believed to improve firm performance and promote business growth.** It seems to be clear that firms using better business practices are

more profitable and grow more quickly (McKenzie and Woodruff 2017). Studies that measure a range of different practices and estimate the impact of training on the proportion of practices that firms use—for example, those of Campos et al. (2017); Dalton et al. (2021); de Mel, McKenzie, and Woodruff (2014); McKenzie and Puerto (2021); Ubfal et al. (2019)—typically find that, for every 20 practices that business training attempts to teach firms, the firms invited to participate in the training implement only one additional practice on average.

**However, the knowledge of better business practices does not necessarily translate into higher profits or sales.** Recent evidence has shown that providing traditional managerial training alone does not typically improve the business performance of small woman-owned firms (McKenzie and Woodruff 2013). But a recent study that conducts a meta-analysis shows that the impact on profits of traditional business training is around 10 percent. The study also highlights that standard business training may be less effective among women than men either because women work in sectors with little scope for growth, or because they face other constraints (McKenzie 2020).

**Consequently, the design of most recent business training programs has been focusing on combining traditional business curricula with other components, such as soft skills training, coaching, and mentoring sessions.** Based on recent evidence, effective training programs do not focus solely on increasing business skills but teach women how to help deal with overlapping household and business demands, enter new sectors, bargain better, and overcome stereotypes (World Bank 2019).



**Alternatives to traditional business training might involve expanding and customizing what is taught.**

These approaches still seek to teach a reasonably comprehensive set of business practices, but either add additional content, or change how the content is taught by providing simple heuristics or using psychology to develop alternate dimensions of business skills (McKenzie 2020).

**Training is more relevant and useful to small firms if it can be effectively adapted to local conditions.**

Most global training providers customize the training content when they introduce it into individual countries. One approach is tested by Dalton et al. (2021), who conducted qualitative interviews with local retailers in Indonesia and coupled the results with regressions of the associations of various business practices with profits and sales. Using this information, they put together a handbook that curates local best practices, corrects common misperceptions about implementing these practices, and provides specific examples on how firms have gone about using a particular practice in the local context. They do not find any significant impacts of the handbook by itself, but, if it is coupled with two 30-minute visits to help firms implement the practices (and a video showing role models talking about using the practices that appears to add no additional benefit beyond the in-person visit), they find that, within approximately a year, firms have increased business practices by 5 to 6 percentage points, firm profits have increased by 21 percent, and sales have increased by 16 percent.

**Recent evidence shows that the use of role models improves training program impacts.**

For women entrepreneurs, man role models can affect behavior by incentivizing women to apply the successful business practices of men or by encouraging women to make the decisions required for the business to succeed (Bursztyn et al. 2014). Furthermore, exposure to a successful role model may provide information about the returns in traditional man-dominated fields and help women gain market information (Field et al. 2016; Wilson 2012). The use of role models who explain how the knowledge being provided in the course has helped them in their business and who potentially give out practical actionable information (for example, where to apply for financing) can enhance the effectiveness of training.

**A training program in Chile has reported on an experiment that had successful alumni appear in person to give a motivational speech during training.**

They find evidence that this increased the impact of training on profits 9 to 12 months later. However, the use of role models does not appear to improve business practices but may work through changes in attitudes and in investment behavior (Lafortune, Riutort, and Tessada 2018).

**Mentoring has also been tested jointly with business training, but the evidence is mixed.**

Engaging peers or

mentors can act as a complement to or substitute for formal classroom training and as a way of better adapting recommendations to local conditions. Standard training programs that incorporate man role models can foster motivation and initiative. One use of mentors has been to have local mentors (or, in some cases, instructors) follow up after classroom training with several in-person visits intended to reinforce the content taught in training and help firms with any implementation issues. This approach has been tested by Drexler, Fischer, and Schoar (2014) in the Dominican Republic; Valdivia (2015) in Peru; McKenzie and Puerto (2021) in Kenya; and Giné and Mansuri (2019) in Pakistan. None of these studies find any sustained impact of these follow-up visits. The other approach is to use mentors as a substitute for, instead of a complement to classroom-based training. Brooks, Donovan, and Johnson (2018) offer an example of this approach; they find that the mentoring led to greater short-term improvements in profits.

**Simplifying the information in business training and using rules of thumb are promising.**

Arráiz, Bhanot, and Calero (2019) tested a short (four hour) heuristic training program focused on rules of thumb in finances against an accounting and finance training program among microenterprises in Ecuador. They find that the heuristic-based approach had increased daily profits a year later by 8.1 percent and daily sales by a similar amount. The program seems to do better among women and individuals with lower cognitive scores.

**According to emerging evidence, among the most auspicious training interventions in favor of women entrepreneurs are ones that include soft skills.**

An example is personal initiative training, which aims to develop a proactive entrepreneurial mindset, such as constantly searching for new opportunities, being self-starting, learning from errors and feedback to overcome obstacles, and thinking of ways to differentiate one's enterprise from other businesses. A study in Togo shows that a training program that mixes soft skills and business literacy skills (specifically, 18 hours of soft skills and 42 hours of business literacy skills) increased monthly profits among women entrepreneurs by 40 percent (Campos et al. 2017). Similarly, a training program that emphasizes self-esteem and entrepreneurship in Ethiopia shows a positive impact on business performance among woman-owned firms (Alibhai, Buehren, and Papineni 2016). Moreover, the training showed positive impacts among both men and women entrepreneurs and was effective among both more and less well-educated women (Campos et al. 2018).

**An important implementation challenge of this type of training is that the quality of the trainers matters more in psychology-based training programs than in hard skills training.**

For example, a study in Ethiopia finds that the change in personal initiative among entrepreneurs is





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strongly correlated with trainer characteristics and particularly with whether the trainer has previous business experience. The average impact of these alternatives to traditional training is a 15 percent increase in profits, which is higher than the 10 percent average impact of traditional training (McKenzie 2020).

The pilot targeted women microentrepreneurs in various Mexican states. To provide results that would be valid for the entire country, the pilot was implemented in eight urban and semiurban areas in Mexico: Aguascalientes, Ecatepec, Irapuato, Iztacalco, Naucalpan de Juárez, Nezahualcoyotl, Querétaro, and Toluca.<sup>3</sup>

## SOFT SKILLS TRAINING BUNDLED WITH HARD MANAGERIAL SKILLS

**This study involved the design and implementation of a rigorous evaluation of a novel business training program that includes traditional business skills and psychology-based skills.** The objective of this intervention is to promote business growth and improve firm performance through a mixed training program. The intervention aims to expand to different contexts the application of recent learning on the importance of soft skills (Campos et al. 2017, 2018) as well as to inform and influence policy interventions that support micro and informal women entrepreneurs in Mexico with a proven training package that may be scaled up nationally and then coupled with additional interventions, such as access to finance.

**The World Bank's Finance, Competitiveness, and Innovation unit worked jointly with CONEVAL on the evaluation of this innovative pilot to support women entrepreneurs.** This is the first and largest pilot project implemented in Mexico to support women entrepreneurs. The program was funded by the Secretaría de Economía through the Instituto Nacional del Emprendedor (National Institute of the Entrepreneur, INADEM) and was implemented through local Mexican NGO CREA, which specializes in programs that support women entrepreneurs.<sup>2</sup>

## THE INTERVENTION

**The mixed curriculum training program aims at building soft skills, innovation capacity, grit, and forward-looking capacity.** The soft skills component was complemented with a more traditional hard skills training program focusing on business literacy and business management skills (that is, pricing, marketing, dealing with suppliers, logistics, financial planning and accounting, legal obligations and rights).<sup>4</sup> The training program consists of a mixed curriculum that includes 42 hours of traditional business skills training and 18 hours of psychology-based skills. There were three core hard skills modules, which included the calculation of costs, the determination of prices, and marketing. Additional hard skills modules covered business planning, organization and production, sales strategies, managing legal requirements, and managing fiscal requirements. The soft skills module lasted three weeks, with a total classroom time of 18 hours. It aimed at guiding entrepreneurs how to acquire and retain competitive advantages to be one step ahead of competitors by developing self-starting and proactive behaviors, a future orientation, and persistence and resilience in the face of obstacles.

**The program's theory of change, described in figure 1.1,**

<sup>2</sup> INADEM was replaced in 2017 by the Unidad de Desarrollo Productivo (Productive Development Unit, UDP). More information on CREA can be found at the NGO's website, at <https://crea.org.mx/>.

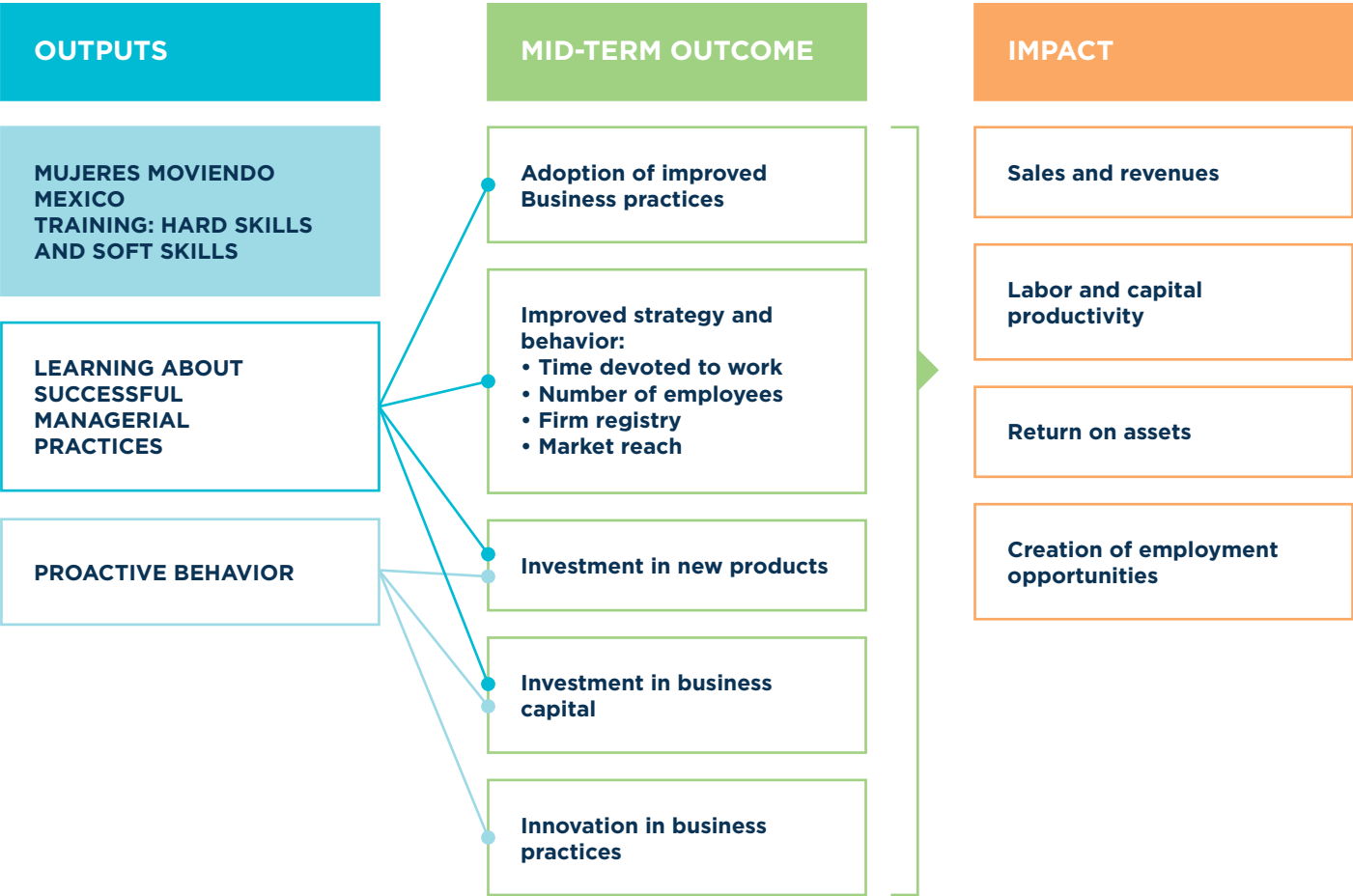
<sup>3</sup> These areas were selected by the Secretaría de Economía.

<sup>4</sup> For a detailed description of the intervention, see appendix.

**guided data collection and the evaluation plan.** A successful training program is expected to enhance the knowledge of the participants on how to run a business effectively, and entrepreneurs were expected to learn the most important business concepts. This knowledge should translate into the adoption of more profitable and modern business practices. The adoption of these practices should

lead to improvements in terms of key channels, positively correlated with performance, such as formalization, access to credit, expansion of employment, investments of time and capital, innovation, and personal initiative. These changes should result in an expansion of the business and improvements in key business outcomes such as sales and profits.

FIGURE 1.1. THE THEORY OF CHANGE OF THE PROGRAM



## STUDY BENEFICIARIES AND DATA COLLECTION

**Women entrepreneurs with existing business were eligible to participate in the study, irrespective of the formality or informality of their businesses.** The population of interest consists of women entrepreneurs who had heard about the program and visited the local offices of NGO CREA to enroll. The study launched a communication campaign in Mexico City and the states

of Aguascalientes, Guanajuato, Mexico, and Querétaro to seek women who owned formal and informal businesses and were interested in improving and growing their businesses. Only entrepreneurs who already had a business that had existed for 12 months or more were eligible to participate. In this way, a total of 3,907 entrepreneurs were admitted to the program.

**At registration, the women entrepreneurs were asked to fill out a baseline survey questionnaire that was distributed between November 2014 and August 2015.**

This baseline survey covered a large range of characteristics of the enterprises, including initial characteristics (for example, the year of the start of operations and the reason the business was launched), managerial and organizational practices (for instance, how the entrepreneurs keep the books and how they deal with suppliers or clients through marketing), information on workers, intermediate inputs, investments, access to credit, cognitive skills, soft skills and attitudes (such as attitudes toward risk, efficiency, the structure of control, self-confidence, ability to trust), sales and profits. Following registration, eligible participants were entered on a list, and, once a center had registered at least 50 participants, a new course was initiated, and half the eligible participants were selected at random and invited to attend.<sup>5</sup>

**Through a randomization at the individual level, half the women entrepreneurs who expressed interest in enrolling were invited to participate in the program.** The characteristics of the group selected to participate in the training and the characteristics of the control group are well balanced (table 1.1). For all key variables of interest, the null hypothesis that the two are statistically indistinguishable cannot be rejected. Table 1.1 is also helpful in assessing the baseline characteristics of the entrepreneurs who participated in the experiment. First, 41 percent of the businesses participating to the program are in the retail sector. Second, in terms of managerial practices, these entrepreneurs only implemented a small share of the overall set of practices assessed; they are working full time in their businesses (an average of 34 hours a week); and less than half the businesses employ one worker (on average, they employ 0.4 workers).

**Of these businesses, 80 percent are informal and more than a third do not have access to any source of financing.** The businesses record about Mex\$4,000 per week in sales, and the profits are about Mex\$1,500 per week. A comparison of these businesses with the typical woman-led enterprise based on

the ENAMIN data reveals that the entrepreneurs who participated in the pilot program tend to record higher sales and profits than the average self-employed women entrepreneur in Mexico, confirming that there is evidence of some positive selection and that the participants to these type of programs tend to be more effective than the average microentrepreneur.<sup>6</sup>

**TABLE 1.1. BALANCE BETWEEN TREATMENT AND CONTROL GROUPS AT BASELINE**

VARIABLE	CONTROL MEAN/SE	TREATMENT MEAN/SE	T-TEST DIFFERENCE
<b>MANAGERIAL PRACTICES</b>			
Marketing Index Normalized	0.019 [0.023]	-0.018 [0.022]	0.037
Stock Management Index Normalized	0.024 [0.023]	-0.023 [0.022]	0.047
Records Management Index Normalized	0.011 [0.023]	-0.011 [0.022]	0.022
Finance Management Index Normalized	0.001 [0.023]	-0.001 [0.022]	0.002
Pricing Management Index Normalized	0.026 [0.022]	-0.025 [0.023]	0.051
Accounting Management Index Normalized	0.011 [0.023]	-0.011 [0.022]	0.022
Composite Business Practices Score Normalized	0.014 [0.023]	-0.014 [0.022]	0.028
<b>CHARACTERISTICS AND INPUTS</b>			
Hours worked week	34.185 [0.512]	33.889 [0.506]	0.296
Number of workers	0.780 [0.032]	0.779 [0.032]	0.001
Number of paid workers	0.411 [0.026]	0.387 [0.025]	0.024
Formal registration	0.208 [0.009]	0.225 [0.009]	-0.016
Access to finance	0.621 [0.011]	0.617 [0.011]	0.004
Savings per month	605.938 [40.007]	662.764 [38.792]	-56.825
Salaries paid	855.196 [78.477]	882.315 [73.869]	-27.119
Inputs and materials	7460.689 [349.274]	7535.994 [366.185]	-75.305
Assets	70125.135 [4653.763]	63493.187 [4165.469]	6631.948
Investment	3027.385 [302.344]	2732.714 [247.717]	294.671
<b>RESULTS</b>			
Clients per day	13.503 [0.431]	13.325 [0.395]	0.178
Products sold per day	27.205 [1.147]	26.981 [1.063]	0.224
Sales per week	4020.122 [165.731]	3748.557 [140.812]	271.564
Profits per week	1557.979 [63.304]	1452.120 [56.814]	105.860

<sup>6</sup> The randomization was carried out after stratifying the eligible participants based on three dimensions: sales, profits, and a skills index based on educational attainment, parental educational attainment, and the results of cognitive tests. See ENAMIN (Encuesta Nacional de Micronegocios, National Survey of Microenterprises) (database), National Institute of Statistics and Geography, Aguascalientes, Mexico, <https://www.inegi.org.mx/programas/enamin/2012/?ps=microdatos>.



**Among other factors, differences in both cognitive and noncognitive skills, as well as time availability, drove the take-up and completion of the training.** Discussion of issues of take-up is important from the perspective of policy makers because it is crucial to learn about the type of entrepreneurs who are more likely to take up and complete the program compared with those who were invited, but decided not to pursue the training.<sup>7</sup> The focus here is on the characteristics of those who take up versus others. Among the most notable differences in cognitive skills and education (table 1.2, columns 1-5) is that women entrepreneurs who completed the training program present a significant difference in years of education (about a nine-month difference). No significant difference was detected in cognitive skills and education between those who start but do not complete the program and those who do not take up the training at all, except that the former scored about 5 percent lower in the Raven test.

**However, several significant differences in noncognitive skills are observed across the three groups** (table 1.2, columns 6-13). The entrepreneurs who completed the training appear to have a significantly higher level of trust

and self-confidence and higher propensity to take risks. Similarly, those entrepreneurs who started, but did not complete the training appear also to have more self-confidence and greater risk propensity than those who did not attend at all.

**Some differences were detected in variables related to household and business characteristics** (table 1.2, columns 14-19). Those entrepreneurs who completed the training live in smaller households, dedicate a significantly smaller amount of time to child-rearing, and, at the same time, are less likely to be sole proprietors of their businesses, which probably frees them to assign more time to their business or training programs. Meanwhile, entrepreneurs with incomplete take-up do not present significant differences compared with those with no take-up at all in terms of household size and time allocated to children and household chores. Those with incomplete take-up are significantly more likely to live in a poorer household than the rest of the entrepreneurs, highlighting a possible reason explaining why they are unable to complete the training in the face of competing demands by their households.



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<sup>7</sup> The problem of selective take-up does not influence the results presented in the next section because the analysis is focused on the intention to treat (ITT) results.

**TABLE 1.2. COMPARING CHARACTERISTICS TO UNDERSTAND THE DRIVERS OF TAKE-UP**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
	Years of schooling	Years of schooling - father	Years of schooling - mother	Total score of raven test (norm)	Total score digit span test (norm)	Self satisfaction =1 (above the median)	Optimism =1 (above the median)	Score 1 trust (0-2)
Incomplete	-0.238 (0.229)	0.164 (0.313)	0.114 (0.279)	-0.0239* (0.0136)	-0.00851 (0.0112)	0.0542* (0.0303)	0 (.)	0.0165 (0.0413)
Completed	0.756*** (0.198)	0.165 (0.271)	0.268 (0.241)	0.0170 (0.0118)	0.00990 (0.00967)	0.0165 (0.0261)	0 (.)	0.0862** (0.0356)
N	1966	1792	1887	1998	1994	2004	2004	2004
T-test	0.000002	0.998	0.548	0.00115	0.0763	0.178	-	0.0678
Control	10.88	6.336	5.725	0.470	0.482	0.495	0	0.533

	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
	Score self-efficacy (1-20)	Score locus of control (1-15)	Score impulsiveness (1-15)	Score self confidence (1-50)	Score risk attitude (1-10)	Extended definition of poverty	Household size	Hours allocated to kids
Incomplete	-0.0567 (0.154)	0.0487 (0.155)	-0.00501 (0.152)	0.882* (0.523)	0.213* (0.109)	0.0454** (0.0227)	-0.0507 (0.119)	-2.286 (1.664)
Completed	-0.106 (0.133)	-0.00779 (0.133)	-0.0406 (0.131)	1.134** (0.452)	0.186** (0.0945)	-0.00816 (0.0196)	-0.192* (0.103)	-3.132** (1.435)
N	1995	1995	1996	1994	1981	2004	1963	1970
T-test	0.727	0.692	0.800	0.602	0.794	0.0108	0.197	0.582
Control	6.213	6.083	6.308	35.34	8.376	0.174	4.117	17.47

	<b>17</b>	<b>18</b>	<b>19</b>
	Hours allocated house	Age of the business	Sole owner
Incomplete	0.569 (0.941)	2.430 (6.523)	-0.0729** (0.0300)
Completed	-0.684 (0.811)	5.388 (5.628)	-0.0686*** (0.0258)
N	2000	1997	1988
T-test	0.149	0.623	0.878
Control	19.25	68.52	0.589

**Note:** \*\*\* Significant at the 1 percent level. \*\* Significant at the 5 percent level. \* Significant at the 10 percent level

## METHODOLOGY AND RESULTS

**Randomization at the individual level enables an estimation of the intention to treat (ITT) effect** of offering the training to interested entrepreneurs by comparing outcomes among interested firms that were invited to take part and firms that were not invited. To maximize power, an ANCOVA specification was used to control for the baseline level of the outcome of interest and pool together multiple survey rounds to obtain the average effect over the pooled rounds (McKenzie 2012). These results are based on the two surveys at follow up, one at midline, about 9–12 months after the treatment, and a second one at end line, 20–24 months after the conclusion of the program.

**The results therefore need to be interpreted as the average impact of the program during the two years following the intervention**, except in the case of the results on learning, which are based only on the medium-term follow-up. The following ANCOVA regression (McKenzie 2012) was estimated for  $t = 2$  (mid-term) and  $t = 3$  (long-term) to control for the randomization strata and the baseline level of the outcome of interest and pool together multiple survey rounds:

$$y_{i,t} = \beta \text{AssignedTreatment}_i + \gamma y_{i,0} + \delta 1(y_{i,0} = \text{missing}) + \sum_{s=1}^T \theta_s 1(t=s) + \sum_{s=1}^n \mu_s 1(j \in \xi_s) + \varepsilon_{i,t}, (1.1)$$

where  $\beta$  is the ITT effect; *AssignedTreatment* is a dummy variable taking the value of one if firm  $i$  is assigned to be offered treatment and zero otherwise;  $y_{i,0}$  is the baseline value, which is dummied out if it is missing, and survey round fixed effects  $\theta_s$  and randomization strata fixed effects  $\mu$  are controlled for. The standard errors are then clustered at the firm level.

**Learning improved after the training.** To measure learning, the mid-term survey included nine questions covering the various training modules, two questions focused on cost

estimation, two questions focused on pricing strategy, and the rest of the questions were focused one each on the respective remaining modules: legal and fiscal considerations, organization and production, marketing, sales strategies, and creation of a business plan. Summing up the responses to all these questions, a normalized index was constructed, business total knowledge. Table 1.3 presents the results for the entire index as well as for the individual answers relative to the various modules. (The coefficients that are statistically significant are highlighted in blue.) The results confirm that, overall, the program had a positive and statistically significant impact on learning, which improved by about 7 percentage points relative to the control mean. This impact is modest, but comparable with other training programs that have proven successful in improving the performance of businesses.

TABLE 1.3. THE IMPACT ON LEARNING

	TREATED	N	CONTROL _MEAN
Business total knowledge	0.045***	3040	0.6237
Business knowledge - costs	0.113***	3040	1.5003
Business knowledge - pricing	0.041	3040	0.766
Business knowledge - legal and fiscal regards	0.101***	3040	0.4983
Business knowledge - organization and production strategies	0.029*	3040	0.6843
Business knowledge - marketing	0.024*	3040	0.8545
Business knowledge - sales strategies	0.091***	3040	0.4647
Business knowledge - business planning	0.008	3040	0.8449

**A significant and broad improvement was observed in business and managerial practices (table 1.4).** The total standardized index shows an increase of about a quarter of a standard deviation, which is a significant increase. The bigger improvements are found in recordkeeping practices, followed by financial management and marketing. Smaller but still statistically significant improvements are exhibited in stock management and accounting methods. No statistically significant improvement was revealed in pricing business practices. A positive result is that the firms that were supported improved in business practices, but also increased the use of information and communication technology, which shows strong complementarity with good managerial practices and is particularly important in the present situation in the context of the COVID-19 crisis.

TABLE 1.4 THE IMPACT ON BUSINESS PRACTICES

	1	2	3	4	5	6	7	8	9	10	11	12
	ICT use	Management Marketing Sub-index	Management Stock Sub-index	Management Records Sub-index	Management Finance Sub-index	Management Index	Modern pricing methods Index	Accounting method Index	Able to account profits Index	Composite Business Practice Score	Composite Business Practice Score Extended	Total Index
Treated	0.0811*** (0.0298)	0.168*** (0.0302)	0.121*** (0.0312)	0.253*** (0.0308)	0.193*** (0.0310)	0.246*** (0.0298)	0.0371 (0.0291)	0.130*** (0.0287)	0.207*** (0.0295)	0.255*** (0.0300)	0.278*** (0.0298)	0.269*** (0.0296)
N	4439	4383	4376	4380	4384	4380	4927	4956	4954	4374	4343	4349
Control_mean	-0.0288	-0.0313	-0.0189	-0.0585	-0.0492	-0.0571	-0.00276	-0.0303	-0.0475	-0.0553	-0.0592	-0.0613

## Business channels and mechanisms

**The supported businesses grew by hiring paid workers and formalizing.** The program's theory of change suggests that many business channels and mechanisms might be expected to lead to improvement in business performance. Table 1.5 presents results that provide some evidence about what is happening inside the black boxes of these firms because of the training they received. First, column 6 illustrates a significant rise in the number of paid workers, which registers an impact of 17 percent relative to the control mean. The total number of workers did not increase, but the total workers includes unpaid family workers and is typically influenced more by household size than by the need to expand the business. Additionally, there is also a statistically significant impact in the likelihood of being formal both through the acquisition of a tax ID from the Secretariat of Finance and Public Credit or by enrolling in the social security system (the Mexican Institute of Social Security).

**As the management of the business becomes more professional, it appears that the women entrepreneurs can afford to reduce the time they work because there is a marginal reduction in worked days** (2 percent, as reported in column 2). While the businesses also appear to be able to increase savings, even if this result is not statistically significant at the conventional level, as shown in column 13, there is no evidence of an increase in the access to the financial system. This is counterintuitive given the greater degree of formalization, the larger size, and the higher profitability of the businesses, but is consistent with a business environment in which small businesses are highly constrained in their access to credit and in which there is a high degree of misallocation of credit (de Mel, McKenzie, and Woodruff 2008).

TABLE 1.5. THE IMPACT ON BUSINESS CHANNELS AND MECHANISMS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Work hours per week	Work days per week	Clients per day	Products per day	Total workers	Paid workers	SHCP Tax ID & Social Security	SHCP Tax ID	Social Security	Firm registry	Bribes paid per month	Access to finance	Savings per month	Asked for a loan ever	Got a loan in the past months
Treated	-0.106 (0.691)	-0.109* (0.0595)	0.234 (0.501)	-0.0382 (1.298)	0.0114 (0.0375)	0.0778** (0.0370)	0.0258** (0.0122)	0.0248** (0.0123)	0.0108** (0.00530)	0.0197 (0.0133)	-2.785*** (1.015)	-0.0122 (0.0143)	110.4 (70.16)	0.00224 (0.0180)	-0.00100 (0.0144)
N	4418	4442	4373	4324	5783	3984	4081	4064	4031	4076	2564	4567	4204	2322	851
Control_mean	34.77	5.011	13.81	26.16	0.813	0.455	0.227	0.225	0.0255	0.281	7.169	0.625	773.6	0.615	0.598



**Personal initiative is a key channel and needs to be assessed.** A key innovation of this entrepreneurial training program was the inclusion of specific modules focused on personal initiative. For this reason, a key channel on which one might expect important results is the improvement in personal initiative.

**Personal initiative is measured carefully using a quantitative approach and a qualitative approach.** Personal initiative was measured using structured open-ended questions designed to assess personal initiative behavior. This measure is based on validated interview questions (Frese and Fay 2001; Frese et al. 1997; Glaub et al. 2014). The questions were adapted in language and terminology to the population that participated to the pilot program. They are designed to capture how active the entrepreneurs are in their businesses and to identify if they seek constantly and innovatively to implement changes to improve their businesses performance or if they act reactively against external factors.

**The personal initiative measure included a quantitative component and a qualitative component.** The quantitative measure referred to the number and the significance of changes made in the business during the six months prior to the interview. Each change was coded as 1 if it was small or minor.<sup>8</sup> Changes were coded as 2 if they were big or substantial.<sup>9</sup> The qualitative portion consisted of five questions on the history of the most important changes indicated by the owner in the business (that is, the changes in which they were more active and involved) to assess the extent to which the entrepreneur showed strong personal initiative.

**The interview questions were as follows:** (1) how was the change implemented in the business; (2) who generated the idea and how (that is, the program participants or others); (3) had the major change been implemented previously by other business owners (that is, participants were asked whether their competitors had done the same

or not); (4) in such a case, what was different about the change relative to the change implemented by other business owners; and (5) what did the other business owners do when they learned that someone had copied the change introduced in their business.

**The answers were coded through a double-blind procedure.** The entrepreneurs were not aware of the coding system, and those who coded and scored the responses were not informed about the treatment status of the entrepreneur. The coders would assign both a quantitative and qualitative score. First, they would count the number of changes and their magnitude (small or big) to calculate the quantitative score. Second, they would code the qualitative component of the personal initiative score using a 5-point Likert scale ranging from 1 (low initiative) if participants have been passive (for example, they reacted to events instead of anticipating them) to 5 (high initiative) if participants have behaved following their own ideas, were different from competitors in the same business environment, and included new ways to realize their ideas (for instance, introducing innovative products and services). The quantitative and qualitative measurements were combined to create a raw total score on personal initiative. This raw score was normalized, or, alternatively, principal component analysis was used to generate an index of personal initiative.

**Both quantitative and qualitative measures of personal initiative show significant improvements after the training.** The results confirm that the entrepreneurs who participated to the program had a higher degree of personal initiative measured through the quantitative index (table 1.6). The increase in personal initiative measured by the qualitative score was even more robust. To address the problem of the multiple hypothesis test, a joint index was built that merges both the qualitative and the quantitative measures (table 1.6, columns 8–9). The results are robust and confirm that there was significant enhancement in personal initiative, a key channel that should lead to improvement in performance.

**TABLE 1.6. THE IMPACT ON PERSONAL INITIATIVE**

	1	2	3	4	5	6	7	8	9
	IP Index	IP quantitative score total	IP quantitative score total normalized	IP Principal Components Quantitative	IP qualitative score total	IP qualitative score total normalized	IP Principal Components Qualitative	IP Quali & Quanti normalized	IP Principal Components Quali & Quanti
Treated	-0.00261 (0.0258)	0.150*** (0.0575)	0.00256 (0.00224)	0.160*** (0.0577)	0.103** (0.0518)	0.0146** (0.00648)	0.0845* (0.0454)	0.0171** (0.00796)	0.0618** (0.0313)
N	5783	4329	4329	3807	4329	4329	4284	4329	4329
Control_mean	1.182	1.654	0.0417	-0.0996	2.038	0.237	-0.0535	0.279	-0.0292

<sup>8</sup> Examples of these changes include “buying a microwave for my business” or painting the interior of the location.

<sup>9</sup> Examples of these changes include hiring employees or expanding the business to another location.



The impact on key business outcomes and performance

The improvement was positive and significant in both weekly sales and profits. The impact on this most important outcome of interest has direct implications for social welfare. Table 1.7 illustrates the impact on sales, profits, and salaries paid. The daily variables tend to be substantially noisier than the weekly variables. There is thus an appreciably larger standard error relative to the mean. This is a key explanation for the results. Indeed, the impact is positive and statistically significant on both weekly sales and profits (table 1.7, columns 2 and 4) pointing to an improvement in sales of 9 percent, while profits rose by 13 percent, pointing to the fact that the businesses are growing and also becoming more profitable. The impact on daily sales and daily profits (respectively, table 1.7, columns 1 and 3) are also both positive and similar in magnitude to the weekly measures, but, because of the noise, are not statistically significant at conventional levels.

There was also a positive and significant increase in the amount of salaries paid monthly (table 1.7, column 5), which is consistent with the expansion in paid workers, but is even larger in terms of the magnitude, about 16 percent relative to the control mean, suggesting that the entrepreneurs supported by the program are not only hiring more paid workers, but are also paying their current employees more.

TABLE 1.7. THE IMPACT ON KEY OUTCOME OF ECONOMIC PERFORMANCE

	1	2	3	4	5
	Sales per day	Sales per week	Profits per day	Profits per week	Salaries per month
Treated	138.3 (87.53)	345.7* (205.3)	46.57 (41.92)	195.0** (78.11)	149.5* (86.47)
N	4308	4194	4123	4100	5204
Control_mean	1587.2	4039.5	657.9	1548.9	911.6

The results are not affected by multiple hypothesis testing bias. Because of the concern over the problem of multiple hypothesis testing, all economic performance indicators were aggregated into indexes. Specifically, an index was built for both sales and profits (both weekly and daily); another index focuses more on inputs from the firm perspective, including salaries and

intermediates; and an overall index includes performance outcomes as well as inputs. The results confirm that the program had a positive and significant impact on the economic performance of the businesses as reflected in the constructed indexes (table 1.8).

TABLE 1.8. THE IMPACT ON THE ECONOMIC PERFORMANCE INDEX

	1	2	3	4
	Sales and profits Index	Inputs and salaries Index	Inputs salaries and workers Index	Inputs and outcomes Index
Treated	639.0* (340.8)	744.3** (377.9)	733.1* (376.3)	1200.7** (567.1)
N	4440	5243	5288	5289
Control_mean	7488.9	6524.0	6492.7	13262.3



Impact heterogeneity and the case for targeting

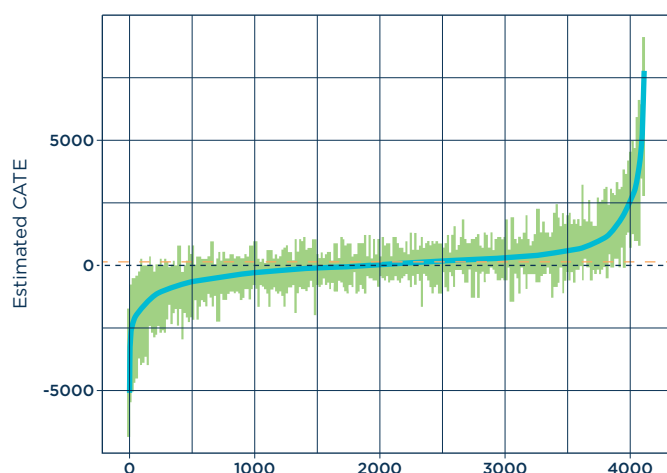
Assessing impact heterogeneity is a key to future targeting. Having shown average treatment effects and the positive and statistically significant impact of the program on profits, which are considered the main outcome of interest, the analysis now addresses an important question for policy makers in the implementation of these programs.

## Does the program benefit all entrepreneurs equally? Or would it be appropriate to target the program on certain entrepreneurs?

**Impact heterogeneity is assessed using novel techniques relying on machine learning algorithms.** Figure 1.2 shows the distribution of the conditional average treatment effect on profits across different entrepreneurs. Specifically, the darker line represents the specific change in profits for each of the entrepreneurs in the pilot program, while the grey shading corresponds to the 95–5 confidence interval. This result is obtained through a Bayesian additive regression trees model, which is one type of machine learning approach to exploring the heterogeneity of impact in the context of a randomized controlled trial, as suggested by recent work of Athey et al, (2017) and Chernozhukov et al. (2018), and a nonparametric Bayesian regression approach proposed originally by Chipman, George, and McCulloch (2010).

**There is evidence of significant heterogeneity.** The important takeaway from this result is that, indeed, there is a significant degree of heterogeneity, which can be explained through a number of baseline observable characteristics comparing the 10 percent of entrepreneurs at the right end of the distribution—with higher conditional average treatment effects—with the 10 percent of entrepreneurs at the left end of the distribution. Who are these entrepreneurs at the two ends of the distribution? What are the biggest differences? The results suggest that the entrepreneurs who benefit more from the program are typically smaller and have lower profits, wage bills and sales, but are also those who are more formal (table 1.9). These results suggest that, to scale up this program, a gain could be achieved by targeting the program on entrepreneurs who are more formal, but also targeting the smaller, less profitable ones.

**FIGURE 1.2. CONDITIONAL AVERAGE TREATMENT EFFECT ON PROFITS**



<sup>10</sup> The US\$573 is equivalent to Mex\$195 per week in additional profits at an exchange rate of Mex\$17 per US\$1.00. The US\$105 is equivalent to Mex\$149 per month in additional salaries at an exchange rate of Mex\$17 per US\$1.00.

**TABLE 1.9. CHARACTERISTICS OF ENTREPRENEURS: HIGH VS LOW CONDITIONAL AVERAGE TREATMENT EFFECTS**

	BOTTOM 10%	SAMPLE MEAN	TOP 10%
Investment	2773.22	2788.27	2691.85
Finance	0.61	0.62	0.61
Soft Skills	0.46	0.50	0.47
Attitudes	5.78	5.76	5.66
Size / Scale	1014.73	814.22	713.71
Management Skills	0.01	-0.01	0.07
Formalization	0.22	0.21	0.25
Profits	1584.46	1450.49	1361.54
Cognitive Skills	0.08	0.00	0.02
Sales	3904.94	3710.59	3576.88

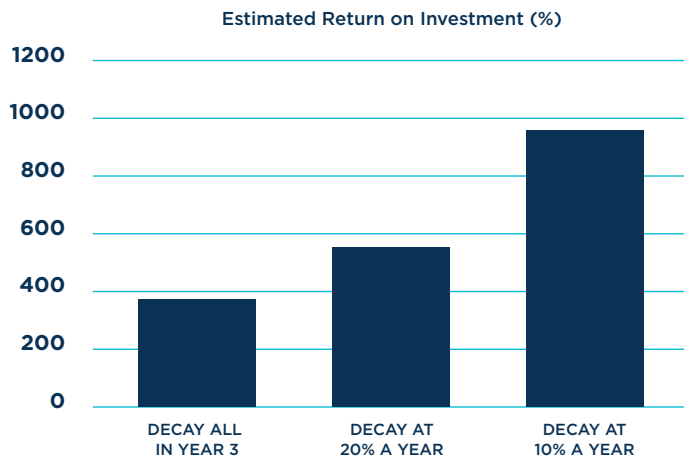
## CONCLUSION: COST EFFECTIVENESS

**In a world in which resources are finite and many alternative options for investing scarce public funds exist, it is important to assess programs and public policies based on cost-effectiveness.** Relying on the results presented in the previous section as well as information about the program costs, the analysis concludes this chapter by providing information on cost-effectiveness and the ROIs associate with the training program.

**The training costs per entrepreneur that CREA incurs and that are subsidized through government grants average about US\$270.** This is less than the corresponding cost of the personal initiative program evaluated by Campos et al. (2018) because it does not include any post-training one-on-one mentoring. The annual gain in terms of profits and in terms of additional salary paid out were US\$573 and US\$105, respectively, during the first two years based on the two follow-up surveys.<sup>10</sup> The first immediate result is that the cost of the program can be paid back in less than a year using the extra profits.

**The calculation of the ROI requires some assumptions about how effects decay through time.** First, the assumption in the most conservative scenario is that all benefits decay immediately in year 3; the resulting ROI is about 380 percent. Alternatively, if the assumption is that the effects decay over five years at a constant rate of 20 percent per year, the ROI would be 570 percent. Finally, on the assumption that the effects on profits decay over 10 years, at a constant rate of 10 percent per year, the ROI would be 966 percent. These results are displayed in figure 1.3.

FIGURE 1.3. RETURN ON INVESTMENT



In conclusion, this novel training for women entrepreneurs that mixes soft skills (that is, personal initiative) with more traditional hard skills (business literacy) can be successful in promoting the growth and profitability of woman-led businesses. The ROI of this program is high. This represents a strong indication to the government of Mexico of the attractiveness of this type of program, but also raises the question of why entrepreneurs do not invest in such programs on their own.

In line with the existing literature, there are at least three important reasons why public interventions to subsidize this sort of program are justified. First, the evidence suggests there is a clear information failure because entrepreneurs are unaware of their weaknesses in managerial and organizational practices (Cirera and Maloney 2017). Second, the markets for managerial and entrepreneurial training in Mexico are not well developed, and entrepreneurs face difficulties in learning about or distinguishing good versus bad training providers. Third, there is a significant degree of uncertainty among entrepreneurs about the adoption of new business and managerial practices because, while the practices may be good on average, it is unclear if they are good for all businesses or all the time for any business (Karlan, Knight, and Udry 2015). In such a context of uncertain returns, risk averse entrepreneurs are unlikely to embark on paying for these types of services.

Another important finding of this work points toward the existence of significant heterogeneity of impact, which suggests that an important area for future work would be to define specific mechanisms to target these types of programs. Targeting becomes crucial for two main reasons in the current situation. First, resources are scarce, and there more than 2.3 million of women entrepreneurs of this type in Mexico, based on the most recent ENAMIN survey. Second, through careful targeting, the government would guarantee that the invested resources have an even higher ROI and generate a bigger impact on growth.







# CHAPTER 2.

# BUSINESS

# MODERNIZATION

# THROUGH CONSULTING

# SERVICES

## INTRODUCTION

**This chapter presents the results of a rigorous impact evaluation of business modernization through consulting services to increase sales performance among traditional retailers.** Modernization is defined as the adoption of tangible structures and business practices in organized retail chains (for example, exterior signage displaying the store name and logo or a database to record product-level information) and the adaptation of these to the practical conditions and constraints of traditional retailers, such as small shop size. In partnership with Mexico's Ministry of Finance, the interventions were conducted from January 2017 to December 2018.

**The main objective of this chapter is to assess the impact of two types of business modernization on the sales of traditional retailers and to explore the mechanisms by which modernization among traditional retailers affects their sales outcomes.** Specifically, the chapter estimates the impact of two types of business modernization on the sales performance of traditional retailers: externally focused modernization (visible to customers) and internally focused modernization (not visible to customers). The chapter also discusses the extent to which men and women entrepreneurs have benefited differently from this program.

**The novelties of this study are the following:**

- The study provides causal evidence to address the question whether traditional retailers can increase firm sales if they adopt the structures and practices of modern retailers.
- The interventions are designed to change physical structures and tangible practices among traditional retailers directly so that these retailers resemble modern retailers. Modernization agents dedicated all their time with business owners to direct the physical implementation of modernization structures. This is different from the traditional classroom-based approaches of standard business training programs. This approach is pedagogically motivated by research in entrepreneurship showing that learning-by-doing plays a more critical role than formal business education in creating lasting behavioral change among entrepreneurs (Politis 2005).
- The study analyzes novel marketing-related mechanisms to explain sales improvements: enhanced store-level branding and improved product management. There appears to be no previous study that has experimentally analyzed how small independent retailers can build a stronger brand or the implications of such branding on firm performance.
- The chapter is divided into five sections. First, it presents a literature review. Second, it describes the intervention in detail. Third, it provides information on the beneficiaries. Fourth, it presents the methodology and the results of the impact evaluation. Fifth, it concludes with a discussion of the cost-effectiveness and ROIs of the program.



## LITERATURE REVIEW

In the retail sector globally, shops may generally be divided into modern retailers and traditional retailers, such as the *kiranas* in India, the *tienditas* in Mexico, and the *xiao mai bu* in China. These two general types of businesses differ in both the physical structure and the business practices that are visible to customers or invisible to customers. Among those that are visible to customers, modern retail outlets post clear signage with their business name and logo on the store exterior, display products and prices in an organized and thoughtful manner, and present customers with promotions and loyalty programs. Meanwhile, traditional outlets invest much less on appearance (figure 2.1). They also differ in terms of business strategy and the relationship with customers.

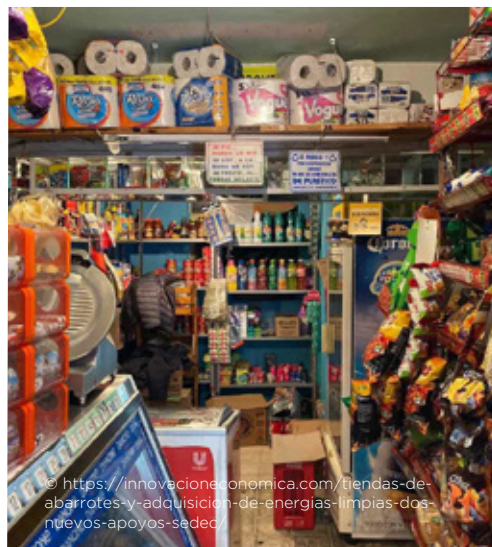
While modern retailers often maintain robust internal systems to track product-level demand, record margins, and manage flows of inventory, traditional outlets usually operate without systems to track product-related information. In this perspective, modernization is defined as the adoption of the tangible structures and business practices of organized retail chains (for example, exterior signage with store name and logo or a database to record product-level information) and the adaption of these to the practical conditions and constraints of traditional retailers such as small shop size.

FIGURE 2.1. TRADITIONAL AND MODERN RETAIL OUTLETS, ROMA NEIGHBORHOOD, MEXICO CITY



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TRADITIONAL RETAILER. Unnamed



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MODERN RETAILER. Abarrotes Delirio



**There are two potential reasons behind these differences: (1) lack of knowledge about the benefits of modernization and (2) a purposeful business marketing strategy.** Traditional retail firm owners may lack the information, capital, and managerial resources to adopt the structures and practices of modern retailers, or they may not perceive this as a productive investment of scarce resources. Traditional retailers may purposefully maintain a less modern appearance to signal affordable prices and accessibility to their target customers, analogous to Walmart projecting itself as a less upscale alternative to Target (Belasen 2008). Thus, the differences may exist broadly because of realistic constraints or strategic considerations on the part of traditional retail firm owners.

**From the customer's perspective, emerging market consumers may value distinct attributes in traditional versus modern retail, preferring the convenience and personalized service of traditional retail** (Narayan et al. 2015). It is plausible that such consumers neither expect nor value modern visual presentation in their traditional shopping experiences. Indeed, they may find a modern retail experience far less accessible and perceive it as more expensive. Moreover, owner time and effort spent on modernizing (for example, manually recording product information throughout the day) may detract from other valuable activities such as interacting closely with customers. If true, these arguments suggest that the effect of greater modernization on sales may be negative.

**Alternatively, modernization may improve the perceptions that consumers have about the firm and may improve the overall organization of the firm.** The reason traditional firms have not modernized may be because of the myriad constraints that they face, such as a lack of expertise or financial capital, rather than a strategic determination that modernization is not beneficial (Bloom et al. 2013; Conley and Udry 2010). If so, greater modernization may have a positive effect on sales. The question of whether modernization leads to increased sales thus involves ambiguous predictions.

**An emerging literature on marketing describes the coexistence of traditional and modern retail, documenting economy-wide trends in sales share and examining consumer choice between the two retail formats** (Bronnenberg and Ellickson 2015; Narayan et al. 2015). The finding that modernization improves sales suggests that retailer decisions to remain traditional do not simply reflect strategic considerations (such as customer preferences), and these decisions may be suboptimal for firms in terms of sales and potentially in terms of growth. Specifically, this project evaluates the impact of business modernization through consulting services aimed at improving business performance.

**Management consulting services have been found to impact firm management positively.** Studies in the development literature find a positive impact on business

outcomes of classroom-based training or consulting programs that impart business education or build the skills of entrepreneurs (Beaman, Magruder, and Robinson 2014; Bloom et al. 2013; Bruhn, Karlan, and Schoar 2018; Calderón, Cunha, and De Giorgi 2020; de Mel, McKenzie, and Woodruff 2014). In this literature, the causal chain often proposed proceeds from skill-building to the implementation of general management practices, which improve firm outcomes. A study of a program targeting women entrepreneurs in Tanzania highlights that training, plus specific individual consulting sessions and coaching improve business practices (Bardasi, Sabarwal, and Terrell 2017). In another study, in Colombia, Iacovone, Maloney, and McKenzie (2019) find that individual and group consulting services similarly improve management practices. However, concerns have been raised in relation to the cost of implementing this type of consulting program, raising the question of how scalable these programs are.

## **SUPPORTING WOMEN ENTREPRENEURS WITH EXTERNALLY AND INTERNALLY FOCUSED MODERNIZATION**

**This study aims to help improve firm performance through low-cost in situ consulting services to implement business modernization among small retailers.** This chapter measures the impact of two types of business modernization on the sales performance of traditional retailers: externally focused modernization (visible to customers) and internally focused modernization (not visible to customers). Specifically, this study (empirically) examines if traditional retailers would benefit from modernization by improving business and growing sales.

**The study offers designs and evaluations of original interventions that directly change physical structures and tangible practices so traditional retailers may come to resemble modern retailers.** The program proposes a novel content and approach that involves directly modernizing firms in the field, which is different from the approach of classroom-based training or consulting programs studied in the development literature.

**The study also explores mechanisms by which the modernization of traditional retailers may affect sales outcomes.** The study eyes store branding as a mechanism to impact modernizing firms externally, that is, in ways that are visible to customers, and enhanced product management as a mechanism to impact modernizing firms internally, that is, in ways that are not visible to customers. By delving into such mechanisms, the study aims to inform and influence policy interventions in support of micro and informal women entrepreneurs in Mexico with a proven training package that may be scaled up nationally and then coupled with additional interventions, such as access to finance.



## THE INTERVENTION

Two distinct interventions were conducted: one that modernized businesses externally and one that modernized businesses internally. Both interventions had the same format and intensity. In both interventions, a firm was partnered with a modernization agent (a top university student majoring in business, economics, or related disciplines) who visited the business 11 times for sessions that lasted 2.5 hours. These sessions were exclusively dedicated to the hands-on implementation of modernization structures. Each agent was trained and supervised by a senior manager at a well-known international NGO (FUNDES), who also made two site visits that were 2.5 hours in length.

In addition, the business owners typically spent one or two additional hours on their own after each session ensuring that the modernizing structures were being fully incorporated. Retailers could thus spend 55 hours (or more) modernizing their business through the program interventions. The interventions were conducted from January 2017 to December 2018 in partnership with Mexico's Ministry of Finance.





**The program highlights 20 external modernization structures relevant to the traditional retailer, all of which are visible to customers (figure 2.2).** Examples of external modernization structures include a large sign with the business name and logo on the store exterior, an attractive product display, and a customer loyalty program. The hypothesis on which this pilot program relies is that implementing these external modernization structures may help traditional retail firms increase sales by enhancing store-level branding.

**There are also 20 internal modernization structures (figure 2.3).** All the structures listed are invisible to consumers, ubiquitous at the back end of modern retail

firms, and currently lacking at traditional retailers. These internal modernization structures are designed to have a strong product focus. They involve understanding the demand for each product, knowing the margins earned on each product, tracking the inflows and outflows of product stock, and storing products effectively, and other product-related activities. Implementing these internal modernization structures may help traditional retail firms increase sales by improving their product management capacities.

**FIGURE 2.2. THE 20 EXTERNAL MODERNIZATION STRUCTURES**

LIST OF 20 EXTERNAL MODERNIZATION STRUCTURES, GROUPED BY MODULE
<b>MODULE 1: EXTERIOR APPEARANCE</b> <ul style="list-style-type: none"> <li>• Clean and tidy storefront</li> <li>• Large sign with business name, logo</li> <li>• Posted store hours, open / close sign</li> <li>• Signs of popular products</li> </ul>
<b>MODULE 2: EXTERIOR APPEARANCE</b> <ul style="list-style-type: none"> <li>• Clean and tidy shop interior</li> <li>• Products unpacked and shelves filled</li> <li>• Well-painted and well-lit interior</li> <li>• Attractive product display</li> </ul>
<b>MODULE 3: SALES TACTICS</b> <ul style="list-style-type: none"> <li>• Professional appearance of sales staff</li> <li>• Well informed sales staff</li> <li>• Customer-service provided by sales staff</li> <li>• Direct-selling techniques by sales staff</li> </ul>
<b>MODULE 4: PRICES LABELS AND PROMOTIONS</b> <ul style="list-style-type: none"> <li>• Fixed and labelled prices</li> <li>• Prices competitive with rivals</li> <li>• Promotions for high-margin products</li> <li>• Promotions for low-rotation products</li> </ul>
<b>MODULE 5: PRICES LABELS AND PROMOTIONS</b> <ul style="list-style-type: none"> <li>• CRM database</li> <li>• Customer communication via media</li> <li>• Customer loyalty program</li> <li>• Receipts provided to customers</li> </ul>

**FIGURE 2.3. THE 20 INTERNAL MODERNIZATION STRUCTURES**

LIST OF 20 INTERNAL MODERNIZATION STRUCTURES, GROUPED BY MODULE
<b>MODULE 1: DEMAND ANALYSIS</b> <ul style="list-style-type: none"> <li>• System to record sales by product</li> <li>• Daily sales recording implemented</li> <li>• System to record expenses by product</li> <li>• Listing of COGS for each product</li> </ul>
<b>MODULE 2: EARNING ANALYSIS</b> <ul style="list-style-type: none"> <li>• Listing of profit margin for each product</li> <li>• Listing of monthly operating profits by product</li> <li>• Listing of sales targets by product</li> <li>• Listing of monthly fixed cost</li> </ul>
<b>MODULE 3: STOCK ORDERING</b> <ul style="list-style-type: none"> <li>• System to record stock inflows</li> <li>• System to record stock outflows</li> <li>• Listing of stock re-order levels</li> <li>• System for stock orders</li> </ul>
<b>MODULE 4: STOCK QUALITY</b> <ul style="list-style-type: none"> <li>• Organized stock areas</li> <li>• Proper storage of stock</li> <li>• Listing of current supplier information</li> <li>• System to research offering of new supplier</li> </ul>
<b>MODULE 5: MANAGING CASHFLOW</b> <ul style="list-style-type: none"> <li>• Credit register for goods sold on credit</li> <li>• Separation of business and personal finance</li> <li>• Saving plan for investment goals</li> <li>• Bank account to save operating profits</li> </ul>

## STUDY BENEFICIARIES AND DATA COLLECTION

**A total of 1,148 traditional retail firms in Mexico City participated in the study.** The sample was randomized into three groups: (1) 380 control firms that received no modernization intervention, (2) 385 external treatment firms that received an intervention to modernize in ways that are visible to customers, and (3) 383 internal treatment firms that received an intervention to modernize in ways that are not visible to customers. The locations of the study firms are shown on map 2.1.

**Women account for 45 percent of the business owners in the study sample. Indeed, in the retail sector, women own and operate businesses at almost the same rate as men.** The typical business owner is 44 years old and has completed high school or received higher education. In terms of business experience, 37.5 percent of owners have had some form of business education (through a course, a program, or training); 78 percent had salaried jobs at some point in the past; and 72 percent were the founders of the businesses that they had registered for the study.

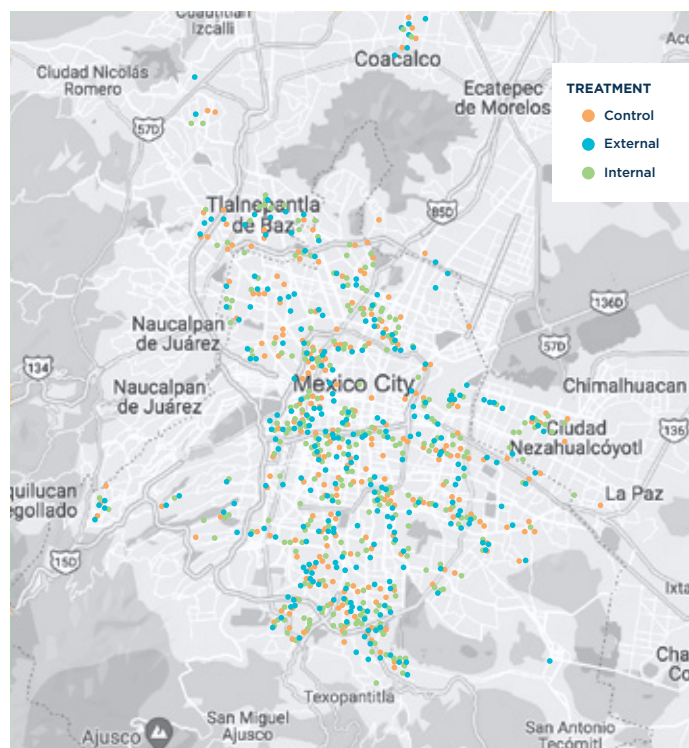
**At baseline, 88 percent of the businesses were selling goods rather than services.** Firms in the sample are not subsistence-level businesses (in line with the program eligibility criterion that sampled retailers would be operating within a permanent physical structure). The average business in the sample has 2.11 paid employees, owns assets valued at US\$21,394, and has a monthly sales turnover of US\$2,449.

**The 1,148 firms in the sample collectively accounted for US\$33.7 million in annual retail sales, thus representing the retail backbone of Mexico City.** Monthly profits accruing to the average owner were US\$502, which can be bench-marked against the US\$843 monthly income of the median Mexican household.<sup>11</sup> In terms of formalization, 30 percent of retailers in the sample previously received a loan from a formal institution, and 61.9 percent are formally registered with a tax authority. Overall, the sample consists of well-established retail firms.

**To measure the medium- and long-term effects of modernization, four rounds of data collection were conducted.** Two rounds occurred preintervention (firm recruitment and baseline), and two rounds occurred postintervention (midline and end line). All survey rounds were conducted as an audit at the business locations by independent enumerators who were blind to the experiment's design and the treatment status of the firms.

- The recruitment survey contained questions on owner and business characteristics to be used to screen eligible retail firms into the sample and as controls in the main analysis.

**MAP 2.1. PARTICIPANT FIRMS, BY TREATMENT ASSIGNMENT, MEXICO CITY**



- The baseline survey also contained questions on business characteristics, but these were mainly focused on collecting key performance data (such as monthly sales) prior to any intervention.
- The midline survey took place 12 months postrecruitment for each firm and concentrated on mechanism measures of store-level branding and product management.
- The end line survey took place roughly 24 months postrecruitment and closely mirrored the baseline survey.

The same performance data on monthly sales were collected in a manner identical to the baseline survey to examine the long-run impact of the two modernization interventions.

<sup>11</sup> 2018 data of ENIGH (Encuesta Nacional de Ingresos y Gastos de los Hogares, National Household Income and Expenditure Survey) (dashboard), Instituto Nacional de Estadística y Geografía (National Institute of Statistics and Geography), Aguascalientes, Mexico, <https://www.inegi.org.mx/programas/enigh/nc/>.

**The randomization of firms was successful, and the three experimental groups are well balanced.** Table 2.1 shows that the means of the control group, the external treatment group, and the internal treatment group are well balanced on observable owner and business characteristics.

equality of three means), only one of the null hypotheses of mean equality at the 5 percent level was rejected, which is what would be expected at random chance. Additionally, the F-test for joint equality of balance variables is not significant for the relevant three-group comparisons. The experimental groups were balanced.

Column 4 reports the p-value from the ANOVA F-tests of equality of the three means. Across the 18 tests (for the

**TABLE 2.1. BALANCE CHECKS FOR FIRMS RANDOMIZED AT BASELINE**

	CONTROL MEAN	EXTERNAL MEAN	INTERNAL MEAN	P-VALUE (F-TEST)
Number of Employees: Unpaid and Paid	2.541	2.310	2.450	0.558
Total Assets (USD)	19,454	17,929	26,840	0.245
Weekly Customers (1 to 12)	4.252	4.411	4.134	0.461
Monthly Sales Estimate (USD)	2,669	2,313	2,366	0.371
Monthly Profits Estimate (USD)	519	461	527	0.489
Registered with Tax ID	0.637	0.624	0.596	0.505
Obtained Formal Loan	0.307	0.284	0.313	0.643
Management Practices Count (0 to 11)	5.488	5.362	5.345	0.678
Technological Practices (0 to 9)	2.955	2.531	2.850	0.033**
Age	44.114	44.922	43.679	0.358
Highest Educational Level (1 to 13)	6.214	5.971	6.098	0.161
Gender (Male=1)	0.587	0.546	0.506	0.117
Married	0.522	0.543	0.518	0.786
Have Dependent Children	0.506	0.527	0.560	0.385
Past Salaried Job	0.795	0.779	0.765	0.599
Owned Another Business	0.352	0.330	0.337	0.817
Founded the Business	0.706	0.721	0.738	0.599
Prior Business Education	0.378	0.353	0.395	0.530
Joint F-Test (Control v External)				0.839
Joint F-Test (Control v External)				0.573
Joint F-Test (Internal v External)				0.498

**Notes:** This table presents balance checks for the full sample of firms based on pre-intervention data on business and owner characteristics. The first three columns present average values by experimental group. The fourth column presents the equality of means F-test. The value displayed is the p-value for this F test where the null hypothesis is equality of three group means. Statistically significant p-values are highlighted by: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01

## METHODOLOGY AND RESULTS

The impact of the modernization interventions was estimated on three retail dependent variables: firm sales (the main performance outcome), store-level branding (the key mechanism for external treatment), and product management (the key mechanism for internal treatment). Apart from providing model-free evidence, the results of the ITT regression are specified in equation 2.1.

$$Y_i = \alpha + \beta_{ext} \text{ExternalTreat}_i + \beta_{int} \text{InternalTreat}_i + x_i' \gamma + \delta Y_{i,base} + \varepsilon_i \quad (2.1)$$

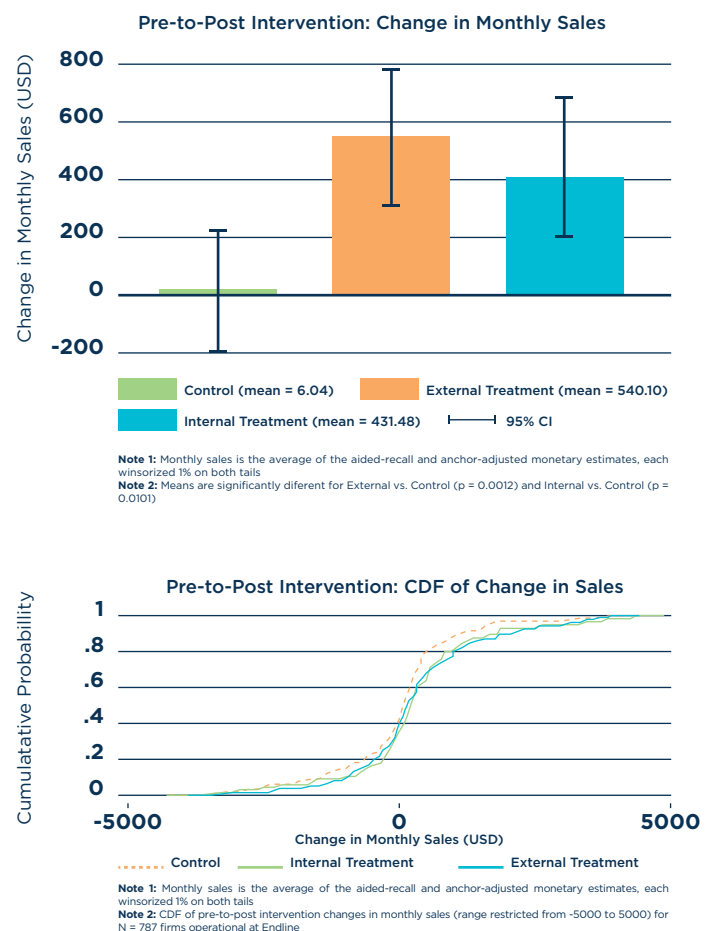
where  $Y_i$  is the dependent variable of interest (sales, store-level branding, product management capacity), of firm  $i$ . The main explanatory variables are  $\text{ExternalTreat}_i$  and  $\text{InternalTreat}_i$ , which are dummy variables indicating whether firm  $i$  was (randomly) assigned to the external or the internal treatment, respectively.  $x_i$  represents a vector of control variables measured preintervention, including eight baseline controls for owner characteristics (gender, age, marital status, children status, education, prior salaried job, prior business ownership, prior business training), eight baseline controls for business characteristics (founder assets, weekly customers, employees, tax registration status, formal loans, profit savings rate, separation of business-personal affairs, business practices), five subsector fixed effects (set of two-digit Standard Industrial Classification codes), and three randomization strata dummies indicating which batch the firm was part of. A control for the baseline value of the dependent variable,  $Y_{i,base}$ , was also used whenever the value was measured at baseline.

**Robust standard errors are reported throughout, except for a notable circumstance where the use of clustered standard errors is discussed.** This specification confers numerous advantages and is recommended in the development economics literature if there are multiple pre- and postintervention data collection rounds (McKenzie 2012). First, because the exogenous treatment assignment variables (rather than endogenous treatment compliance variables) are used, ITT estimates are provided that are unbiased for the average treatment effect. Second, because the value of the dependent variable is included at baseline, as well as control variables measured at baseline, the precision of the estimates is improved and can account for any group imbalances deriving from attrition or nonsurvival. Next, this specification is used to estimate the impact of externally focused and internally focused modernization on firm sales.

## The impact of modernization on firm sales

The study finds that there is a significant and persistent effect of both external modernization and internal modernization on firm sales. Figure 2.4, panel a (top), provides initial model-free evidence that both modernization interventions improved the sales performance of retail firms. While monthly sales did not differ among the groups at baseline, the average change in monthly sales from baseline to end line was significantly larger among external and internal treatment group firms than among control group firms. This improvement in average monthly sales from baseline to end line is not an artefact of outliers. All sales variables were Winsorized 1 percent on both tails. Additionally, in figure 2.4, panel b (bottom), the empirical cumulative distribution function for the change in monthly sales is plotted by treatment assignment. The cumulative distribution function for the external and internal treatment groups is rightward shifted, indicating that, across the distribution of firms, treatment group firms realized greater increases in sales (from baseline to end line) compared with control group firms.

**FIGURE 2.4. PRE- TO POSTINTERVENTION: CHANGE IN MONTHLY SALES**



Within two years after the firm owners were recruited to participate in the program, firms in the external treatment group and the internal treatment group had increased monthly sales by 18.7 percent and 15.5 percent, respectively. The model-free evidence is supported by the ITT regression analysis. Table 2.2 reports estimates of  $\beta_{ext}$  and  $\beta_{int}$  from equation 2.1. The estimates indicate a positive and statistically significant effect of external and internal modernization treatments on monthly sales. The estimates are first interpreted in columns 1–3, where the dependent variable is monetary monthly sales. Firms assigned to external treatment had earned US\$576.50 more than the control group at midline (12 months postrecruitment) and US\$545.70 more than the control group at end line (24 months postrecruitment), which represents an average monthly sales improvement of 18.7 percent over the control group,

as shown in column 3. Similarly, firms assigned to the internal treatment had earned US\$466.30 more than control firms at midline (12 months postrecruitment) and US\$476.00 more than control firms at end line (24 months postrecruitment), which represents an average monthly sales improvement of 15.5 percent over the control group, as shown in column 3. Columns 4–6 show that these results are robust to an alternative sales dependent variable: instead of Winsorizing, the average is taken of the log of aided-recall sales and anchor-adjusted sales. This specification handles outliers differently, but shows comparable, if not larger, effect sizes relative to the modernization treatments on sales. This analysis illustrates that modernization is beneficial to retail firms in Mexico City and that remaining traditional in external image as well as internal systems may be suboptimal for firms.

**TABLE 2.2. IMPACT OF MODERNIZATION INTERVENTIONS ON FIRM SALES**

	DV: MONTHLY SALES (USD)			DV: LOG OF MONTHLY SALES		
	1 Midline	2 Endline	3 Midline and Endline Avg.	4 Midline	5 Endline	6 Midline and Endline Avg.
External Treat	576.5*** (222.7)	545.7*** (183.2)	518.9*** (163.8)	0.119* (0.0679)	0.198*** (0.0745)	0.190*** (0.0694)
Internal Treat	466.3** (216.6)	476.0*** (177.4)	430.0** (167.8)	0.175*** (0.0639)	0.226*** (0.0757)	0.237*** (0.0703)
Baseline Value of DV	Yes	Yes	Yes	Yes	Yes	Yes
Sub-sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Biz / Owner Controls	Yes	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of DV: Control	2439.5	2954.7	2776.8	10.22	10.33	10.27
SD of DV: Control	3161.3	3754.1	3409.5	1.084	1.378	1.305
Effect Size in SD: Ext	0.182	0.145	0.152	0.109	0.144	0.146
Effect Size in %: Ext	23.63	18.47	18.69	12.59	21.95	20.96
Effect Size in SD: Int	0.148	0.127	0.126	0.162	0.164	0.182
Effect Size in %: Int	19.12	16.11	15.48	19.14	25.35	26.75
Obs.	883	791	791	883	791	791
P-Value: $\beta_{ext} = \beta_{int}$	0.624	0.714	0.595	0.360	0.640	0.363

**Notes:** Data underlying these regressions were collected in two survey rounds – Midline (6 months post-intervention) and Endline (18 months post-intervention). The DV in Columns (1)-(2) is the monetary measure of monthly sales, i.e. the average of the recall-based and anchored-adjusted monetary sales estimates, both winsorized 1% on each tail. The DV in column (3) is the average of the DVs in (1) and (2), thus representing the average monthly sales in USD over the two survey rounds. The DV in Columns (4)-(5) is the log transformed measure of monthly sales, i.e. the average of the log of the recall-based and anchored-adjusted sales estimates. The DV in column (6) is the average of the DVs in (4) and (5), thus representing the average of the log of monthly sales over the two survey rounds. The indicated regressions include: the baseline value of the dependent variable, 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 8 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; profit savings rate; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. All regressions exclude firms that were found non-operational or attrited during the survey round. Robust standard errors are in parentheses. P-values are highlighted as: p < 0.1 p < 0.05 p < 0.01



**Women retailers do not seem to benefit less than men retailers from business modernization.** Table 2.3 presents the results of the modernization interventions by sex. The coefficient of the interaction *Treated Firm x Male Owner* is not statistically significant in any of the firm performance indicators (sales, profits, and standardized composite: sales and profits). These results show that business modernization through consultation services improves firm performance regardless of the sex of the owner of the business. However, even if the regression results are noisy and nonsignificant at conventional levels, the impact of the intervention on sales may be greater among men, while there is no different impact on profits (the interaction *Treated Firm x Male Owner* is a well-estimated zero). This suggestive evidence may derive from the fact that, while man-owned businesses increased their sales more, woman-owned businesses improved more in back end efficiency and product management. Finally, it should be recalled that, given the sample size, the study may have limited power to detect small differences between men and women retailers.



**TABLE 2.3. IMPACT OF MODERNIZATION ON FIRM PERFORMANCE**

	<b>1</b> Monthly Sales (USD)	<b>2</b> Monthly Profits (USD)	<b>3</b> Standardized Composite: Sales and Profits
Male Owner	-228.6 (224.8)	-40.88 (84.98)	-0.0420 (0.0803)
Treated Firm	357.2** (166.9)	163.5** (69.27)	0.144** (0.0660)
Treated Firm x Male Owner	290.2 (303.5)	-1.482 (116.4)	0.0247 (0.101)
Baseline Value of DV	Yes	Yes	Yes
Sub-sector FE	Yes	Yes	Yes
Biz / Owner Controls	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes
Mean of DV: Control	2954.7	649.4	0
SD of DV: Control	3754.1	1078.5	1.000
Effect Size in SD: Female	0.0952	0.152	0.144
Effect Size in %: Female	12.09	25.18	-
Obs.	738	737	738
F Stat.	18.59	11.09	17.91

**Notes:** This table summarizes the intent-to-treat (ITT) effects of our modernization interventions, split by gender. Data underlying these regressions were collected at Endline (18 months post-intervention). The DV in Column (1) is the monetary measure of monthly sales, i.e. the average of the recall-based and anchored-adjusted monetary sales estimates, both winsorized 1% on each tail. The DV in Column (2) is the monetary measure of monthly profits, i.e. the average of the recall-based and anchored-adjusted monetary profits estimates, both winsorized 1% on each tail. The DV in Column (3) is constructed as the average of the standardized values of: recall-based sales winsorized 1%, anchor-adjusted sales winsorized 1%, log of recall-based sales, log of anchor-adjusted sales, recall-based profits winsorized 1%, anchor-adjusted profits winsorized 1%, IHS of recall-based profits, and IHS of anchor-adjusted profits. All regressions include: the baseline value of the dependent variable, 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 7 baseline controls for business characteristics (fouder; assets; weekly customers; employees; tax registration status; formal loans; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. Robust standard errors are in parentheses. P-values are highlighted as: p<0.1\* p<0.05\*\* p<0.01\*\*\*

## Effect of external modernization on store-level branding

**Sales increased through different channels for externally modernizing firms and internally modernizing firms.** Results show that externally modernizing firms improved store-level branding. Table 2.4, columns 1–2 show the ITT

effects of external and internal modernization on the two photo-based store-level branding variables, with the sample of firms operational and not attriting at end line. N = 784 of these firms consented to provide photographs. Each observation in these regressions is at the photograph-rating level (five independent ratings per photograph, two photographs per firm). Thus, in all specifications, rater fixed effects for the 1,425 raters in the

sample and cluster standard errors at the level of the firm (the unit of randomization) are included.

**Focusing on the store brand index in column 1 first, one may see a positive and statistically significant effect of the external modernization treatment.** Compared with control group firms, external treatment firms received a 6.2 percent (0.132 standard deviation) higher normalized average score across the various branding dimensions. Column 2 shows the ITT effects of modernization treatments on the store brand dimensions count. Firms in the control group performed at a high level on an average 3.29 of 9.00 branding dimensions. In contrast, firms in the external treatment group performed at a high level on an average of 3.72 dimensions, an improvement of 13.2 percent (0.144 standard deviation). This effect is statistically significant at the 1 percent level.

**A critical point is that no improvement was observed in branding scores among firms that were assigned to receive the internal modernization treatment.** This helps test whether it is truly the external modernization structures that assisted firm owners in strengthening their store-level brand. If branding improvements were driven by other, generic aspects of the external treatment (such as the feeling of receiving a reward, receiving attention and assistance, a motivation boost, being observed by respected third parties), one might expect to see the same improvements in branding among firms assigned to receive the internal treatment, too. However, this is not observed: the coefficients on internal treatment are roughly a quarter of the size of the coefficients on external treatment, while standard errors are similar. Overall, this analysis shows that externally modernizing firms in Mexico City were able to build a stronger brand, as assessed by independent raters.

**TABLE 2.4. MECHANISM ANALYSIS: STORE-LEVEL BRAND AND FIRM SALES**

	IMPACT OF TREATMENTS ON STORE BRANDING		CORRELATION OF STORE BRANDING AND SALES: OLS		IMPACT OF STORE BRANDING ON SALES: IV	
	1 Store Brand Index (Continuous: 0 to 1)	2 Store Brand Dimensions (Count: 0 to 9)	3 Post-Treat Sales (USD)	4 Post-Treat Sales (USD)	5 Post-Treat Sales (USD)	6 Post-Treat Sales (USD)
External Treat	0.0330*** (0.0123)	0.435*** (0.145)				
Internal Treat	0.00871 (0.0122)	0.189 (0.141)				
Store Brand Index (Cont: 0 to 1)			250.1** (100.4)		9962.0*** (3107.3)	
Store Brand Dims. (Cont: 0 to 9)				21.29** (8.511)		865.9*** (282.4)
Baseline Value or DV	N/A	N/A	Yes	Yes	Yes	Yes
Biz / Owner Controls	Yes	Yes	No	No	Yes	Yes
Sub-sector / Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of DV: Control	0.532	3.288	2792.6	2792.6	2792.6	2792.6
SD of DV: Control	0.250	3.013	3451.8	3451.8	3451.8	3451.8
Effect Size in % (SD): Ext	6.2 (.132)	13.2 (.144)	-	-	-	-
Effect Size in % (SD): Int	Not Sig.	Not Sig.	-	-	-	-
First Stage F Stat.	-	-	-	-	16.9	16.42
Obs.	7184	7184	7050	7050	7050	7050
No. of Firms	784	784	769	769	769	769

**Notes:** This table summarizes the relationship between our modernization interventions, store-level branding and retail firm sales. There are 2 photographs corresponding to every included firm, each rated by approximately 5 MTurk raters. The DV in Column (1) is the normalized average score given to a firm's photograph by an MTurk Rater on nine dimensions of store branding: attractiveness, willingness to recommend, willingness to pay, trust in brand, high quality signals, brand excitement, brand sophistication, brand sincerity, and brand competence. The DV in Column (2) is a count of these nine dimensions of store branding on which the firm received an above-median score from the MTurk rater. In Columns (3) to (6) the DV is the average monthly sales in the two post-treatment data collection rounds. In the 2SLS regressions of Columns (5) and (6), store branding variables are instrumented by assignment to external treatment. The indicated regressions include: the baseline value of the dependent variable; 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 8 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; profit savings rate; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 1425 MTurkWorker FE. All regressions exclude firms that were found non-operational or attrited during the Endline survey round. Clustered robust standard errors (by firm) are in parentheses. P-values are highlighted as:  $p < 0.1$   $p < 0.05$   $p < 0.01$

**External modernization positively impacts the store-level branding of traditional retailers.**

The next step of the mechanism analysis is to show that the enhanced store-level brand drives sales increases. The key empirical challenge is to avoid randomizing the branding variable. Correlational evidence as well as an instrumental variable analysis relying on the exogenous variation in treatment assignment are thus now provided. Table 2.4, columns 3–4, shows the regression of posttreatment average monthly sales on the two store-level branding variables while controlling for average monthly sales at baseline.

**There is a positive and statistically significant association.**

The passage from the minimum to maximum possible score on branding is associated with a US\$250 jump in sales (column 3), while high performance on all nine dimensions of branding is associated with a US\$191 increase in monthly sales (column 4). These estimates do not have a causal interpretation. So, in table 2.4, columns 5–6, IV regressions are conducted on monthly sales on the two store-branding variables, instrumenting for them with assignment to external treatment (which was randomized). This instrument is relevant: first-stage F-statistics of 16.90 and 16.42 in columns 5 and 6, respectively. The IV regression coefficients are larger than the ordinary least squares (OLS) coefficients and statistically significant at the 1 percent level. They suggest that a shift from the minimum to maximum possible score on branding drives a US\$9,960 increase in monthly sales, while a shift from below-median to above-median on one dimension of branding results in a US\$866 increase in monthly sales.

**Effect of internal modernization on product management**

**Internally modernizing firms did not improve their store-level brand, but they significantly improved product management.**

Results show that internal modernization improves sales by enhancing the product management capacity in retail firms. The first step is to show the treatment effects of the internal modernization intervention on product management. Table 2.5, columns 1–2, show the ITT effects of external and internal modernization treatments on the two product management variables, with the sample of firms operational and not attriting at end line. Focusing on the product management index in column 1 first, one may see a positive and statistically significant effect of the internal modernization treatment. Compared with control group firms, internal treatment firms received a 13.3 percent (0.317 standard deviation) higher normalized average score across the various product management dimensions. Column 2 shows the ITT effects of modernization treatments on the product management dimension count. Firms in the control group performed,

on average, at a high level on 2.17 of 6.00 product management dimensions. In contrast, firms in the internal treatment group performed at a high level on 2.77 dimensions on average, an improvement of 27.3 percent (0.335 standard deviation). This effect is statistically significant at the 1 percent level. Analogous to the analysis on store-level branding, the external treatment group did not significantly improve product management relative to the control group. This provides evidence that it is indeed internal modernization structures that assisted firm owners in strengthening their product management capacity, rather than any common aspects of both modernization interventions. The coefficients on the external treatment are less than half the size of the coefficients on internal treatment, while standard errors are similar.





TABLE 2.5. MECHANISM ANALYSIS: PRODUCT MANAGEMENT AND FIRM SALES

	IMPACT OF TREATMENTS ON PROD. MANAGEMENT		CORRELATION OF PROD. MANAGEMENT AND SALES: OLS		IMPACT OF PROD. MANAGEMENT ON SALES: IV	
	1 Prod. Mgmt. Index (Continuous: 0 to 1)	2 Prod. Mgmt. Dimensions (Count: 0 to 6)	3 Post-Treat Sales (USD)	4 Post-Treat Sales (USD)	5 Post-Treat Sales (USD)	6 Post-Treat Sales (USD)
External Treat	0.0246 (0.0150)	0.214 (0.145)				
Internal Treat	0.0584*** (0.0161)	0.593*** (0.151)				
Prod. Management Index (Cont: 0 to 1)			1405.5*** (355.4)		7125.3** (3126.5)	
Prod. Management Dims. (Cont: 0 to 6)				135.6*** (36.24)		692.1** (301.7)
Baseline Value or DV	N/A	N/A	Yes	Yes	Yes	Yes
Biz / Owner Controls	Yes	Yes	No	No	Yes	Yes
Sub-sector / Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of DV: Control	0.438	2.174	2776.8	2776.8	2776.8	2776.8
SD of DV: Control	0.185	1.767	3409.5	3409.5	3409.5	3409.5
Effect Size in % (SD): Ext	Not Sig.	Not Sig.	-	-	-	-
Effect Size in % (SD): Int	13.3 (0.317)	27.3 (0.335)	-	-	-	-
First Stage F Stat.	-	-	-	-	13.80	16.73
Obs.	793	793	781	781	781	781

**Notes:** This table summarizes the relationship between our modernization interventions, product management and retail firm sales. The DV in Column (1) is the normalized average score given to the firm by an auditor on six dimensions of product management: improving product assortment, improving product quality, sales effort on popular/profitable products, improving supplier selection, aligning stock orders with demand, and saving time and money in procurement. The DV in Column (2) is a count of these six dimensions of product management on which the firm received an above-median score from the auditor. In Columns (3) to (6) the DV is the average monthly sales in the two post-treatment data collection rounds. In the 2SLS regressions of Columns (5) and (6), product management variables are instrumented by assignment to internal treatment. The indicated regressions include: the baseline value of the dependent variable, 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 8 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; profit savings rate; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. All regressions exclude firms that were found non-operational or attrited during the Endline survey round. Robust standard errors are in parentheses. P-values are highlighted as: p < 0.1\* p < 0.05\*\* p < 0.01\*\*\*

### Enhanced product management drives increased sales in internally modernizing firms.

By establishing internal systems that tracked product-level demand, recorded margins, and managed flows of inventory, retailers were able to gain a deeper understanding of their products, make more well-informed decisions regarding their offerings, and thus improve firm sales. Table 2.6, columns 3–4, shows the results of the regression of average posttreatment monthly sales on the two product management variables, respectively, while controlling for average monthly sales at baseline.

**There is a positive and statistically significant association: a shift from the minimum to maximum possible score on product management is associated with a US\$1,405 jump in sales** (column 3), while high-level performance in all six dimensions of product

management is associated with a US\$810 increase in monthly sales (column 4). Finally, table 2.6, columns 5–6, shows the results of IV regressions of monthly sales on the two product management variables, instrumenting for them with assignment to internal treatment (which was randomized). This instrument is relevant: first-stage F-statistics of 13.80 and 16.73 are obtained. The IV regression coefficients are larger than the OLS coefficients and statistically significant at the 1 percent level. They suggest that a shift from the minimum to maximum possible score on product management drives a US\$7,125 increase, while moving from below-median to above-median on one dimension of product management results in a US\$692 increase in monthly sales. Overall, the pattern of the results obtained here suggests a positive relationship between product management and firm sales.

**TABLE 2.6. MECHANISM ANALYSIS: STORE-LEVEL BRAND AND FIRM SALES**

	IMPACT OF TREATMENTS ON PROD. MANAGEMENT		CORRELATION OF PROD. MANAGEMENT AND SALES - OLS		IMPACT OF PROD. MANAGEMENT ON SALES - IV	
	1 Prod. Mgmt. Index (Continuous: 0 to 1)	2 Prod. Mgmt. Dimensions (Count: 0 to 6)	3 Post-Treat Sales (USD)	4 Post-Treat Sales (USD)	5 Post-Treat Sales (USD)	6 Post-Treat Sales (USD)
External Treat	0.0246 (0.0150)	0.214 (0.145)				
Internal Treat	0.0584*** (0.0161)	0.593*** (0.151)				
Prod. Management Index (Cont: 0 to 1)			1405.5*** (355.4)		7125.3** (3126.5)	
Prod. Management Dims. (Cont: 0 to 6)				135.6*** (36.24)		692.1** (301.7)
Baseline Value or DV	N/A	N/A	Yes	Yes	Yes	Yes
Biz / Owner Controls	Yes	Yes	No	No	Yes	Yes
Sub-sector / Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of DV: Control	0.438	2.174	2776.8	2776.8	2776.8	2776.8
SD of DV: Control	0.185	1.767	3409.5	3409.5	3409.5	3409.5
Effect Size in % (SD): Ext	Not Sig.	Not Sig.	-	-	-	-
Effect Size in % (SD): Int	13.3 (0.317)	27.3 (0.335)	-	-	-	-
First Stage F Stat.	-	-	-	-	13.80	16.73
Obs.	793	793	781	781	781	781

**Notes:** This table summarizes the relationship between our modernization interventions, product management and retail firm sales. The DV in Column (1) is the normalized score given to the firm by an auditor on six dimensions of product management: improving product assortment, improving product quality, sales effort on popular/profitable products, improving supplier selection, aligning stock orders with demand, and saving time and money in procurement. The DV in Column (2) is a count of the six dimensions of product management on which the firm received an above-median score from the auditor. In Columns (3) to (6) the DV is the average monthly sales in the two post-treatment data collection rounds. In the 2SLS regressions on Columns (5) and (6), product management variables are instrumented by assignment to internal treatment. The indicated regressions include: the baseline value of the dependent variable, 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 8 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; profit savings rate; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. All regressions exclude firms that were found non-operational or attrited during Endline survey round. Robust standard errors are in parentheses. P-values are highlighted as:  $p < 0.1^*$   $p < 0.05^{**}$   $p < 0.01^{***}$

**The impact of external treatment on store branding and the impact of internal treatment on product management have been estimated by sex.** According to the regressions results, the impact of external modernization on improvements in firm store-level branding is not different among women owners. However, external modernization seems to benefit more men retailers marginally (table 2.7). Yet, while internal modernization improves sales by enhancing the product management capacity in woman- and man-owned retail firms, preliminary evidence shows internal modernization improves product management more among women entrepreneurs (table 2.8).



**TABLE 2.7. IMPACT OF EXTERNAL TREATMENT ON STORE BRANDING**

	<b>1</b> Store Brand Index (Continuous: 0 to 1)	<b>2</b> Store Brand Dimensions (Count: 1 to 9)
Male Owner	-0.0347*** (0.0123)	-0.393*** (0.140)
External Treat	0.0275* (0.0147)	0.338** (0.171)
External Treat x Male Owner	0.00660 (0.0212)	0.0717 (0.245)
Sub-sector FE	Yes	Yes
Biz / Owner Controls	Yes	Yes
Strata FE	Yes	Yes
Mean of DV: Control	0.534	3.303
SD of DV: Control	0.248	3.013
Effect Size in SD: Women	0.111	0.112
Effect Size in %: Women	5.142	10.23
Number of Firms	736	736
Number of Photos	6729	6729

**Notes:** This table summarizes the intent-to-treat (ITT) effects of the external modernization intervention on score-level brand, split by gender. For each photograph by MTurk Raters on nine dimensions of score branding: attractiveness, willingness to recommend, willingness to pay, trust in brand, high quality signals, brand excitement, brand sophistication; brand sincerity, and brand competence. The DV in Column (2) is a count of these nine dimensions of store branding on which the firm received an above-median score from MTurk raters. All regressions include: 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 7 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. Clustered standard errors (by firm) are in parentheses. P-values are highlighted as: p<0.1\* p<0.05\*\* p<0.01\*\*\*

**TABLE 2.8. IMPACT OF INTERNAL TREATMENT ON PRODUCT MANAGEMENT**

	<b>1</b> Product Management Index (Continuous: 0 to 1)	<b>2</b> Product Management Dims. (Count: 0 to 6)
Male Owner	-0.00429 (0.0158)	-0.0698 (0.157)
Internal Treat	0.0528** (0.0216)	0.567*** (0.208)
Internal Treat x Male Owner	-0.0132 (0.0292)	-0.181 (0.274)
Sub-sector FE	Yes	Yes
Biz / Owner Controls	Yes	Yes
Strata FE	Yes	Yes
Mean of DV: Control	0.438	2.174
SD of DV: Control	0.185	1.767
Effect Size in SD: Women	0.286	0.321
Effect Size in %: Women	12.06	26.10
Obs.	748	748

**Notes** This table summarizes the intent-to-treat (ITT) effects of internal modernization interventions on product management, split by gender. The DV in Column (1) is the normalized average score given to the firm by an auditor on six dimensions of product management: improving product assortment, improving product quality, sales effort on popular/profitable products, improving supplier selection, aligning stock orders with demand, and saving time and money procurement. The DV in Column (2) is a count of these six dimensions of product management on which the firm received an above-median score from the auditor. All regressions include: 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 7 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. Robust standard errors are in parentheses. P-values are highlighted as: p<0.1\* p<0.05\*\* p<0.01\*\*\*

Cost effectiveness analysis

The study conducted a cost-benefit analysis to show the cost-effectiveness of modernization interventions (table 2.9, panel a). Assignment to the modernization treatments led to a US\$116 monthly increase in net income or profits, and these gains persisted even 24 months postrecruitment. The costs to a policy stakeholder of implementing a modernization program are similar to the estimated costs in the study. Under a

low-cost scenario that the study was able to achieve through partnerships with NGOs and universities, the complete modernization program cost approximately US\$675 per firm (table 2.9, panel b). This means it might take the typical retail owner approximately six months to start realizing a positive modernization ROI. If a professional management consultancy implements the program, the complete program would then cost US\$1,365 per firm, and, so, positive ROIs would be realized after 12 months.

TABLE 2.9. COST-EFFECTIVENESS OF MODERNIZATION PROGRAMS

Panel A: Profit Gain due to Modernization Program (ITT Estimates)

	1 Monthly Profits (USD)	2 IHS of Monthly Profits
Assigned to Treatment	116.1* (60.98)	0.701* (0.369)
Baseline Value of DV	Yes	Yes
Sun-sector FE	Yes	Yes
Biz / Owner Controls	Yes	Yes
Strata FE	Yes	Yes
Mean of DV: Control	649.4	6.882
SD of DV: Control	1078.5	5.270
Effect Size in % (SD)	17.881 (.108)	10.181 (.133)
Obs.	791	791

**Notes:** This table summarizes the intent-to-treat (ITT) effects of our modernization interventions on firm profits. Data underlying these regressions were collected at Endline (24 months postrecruitment). The DV in Column (1) is the monetary measure of monthly profits, i.e. the average of the recall-based and anchored-adjusted monetary profits estimates, both winsorized 1% on each tail. The DV in Column (2) is the inverse-hyperbolic-sine transformed measure of monthly profits, i.e. the average of the IHS of the recall-based and anchored-adjusted profit estimates. All regressions include: the baseline value of the dependent variable, 8 baseline controls for owner characteristics (gender; age; marital status; children status; education; prior salaried job; prior business ownership; prior business training), 7 baseline controls for business characteristics (founder; assets; weekly customers; employees; tax registration status; formal loans; separation of business-personal affairs; business practices), 5 sub-sector fixed effects (set of two digit SIC codes) and 3 strata dummies indicating which randomization/implementation batch the firm was part of. Robust standard errors are in parentheses. P-values are highlighted as: p < 0.1\* p < 0.05\*\* p < 0.01\*\*\*

Panel B: Cost per Firm (USD) of Modernization Treatment

	Low-Cost Scenario	High-Cost Scenario
1. Personnel Costs for 35 hrs of Sessions	360	1050
Modernization Agent	75	-
Supervisor	225	-
Professional Managment Consultant	-	875
Organizational Overheads (20%)	60	175
2. Owner Opportunity Cost for 50 hrs	215	215
3. Estimated Materials Cost	100	100
Total Cost in USD	675	1365
Net Profit Gain per Month in USD	116	116
Time to Realize Positive ROI	5.8 months	11.8 months

**Notes:** In Panel B, we chart our costs of a modernization program under two scenarios: a low-cost scenario that corresponds to the intervention we implemented in partnership with universities and NGOs, and a high-cost scenario where professional management consultants deliver the intervention. Professional management consultant hourly wages were estimated from a Glassdor search of management consultants salaries in Mexico City. We present costs for external modernization intervention, as this intervention was more expensive. We estimated cost of the following materials, typically implemented during external modernization intervention: large banner for store (USD 50), flyers or newsletters (USD 25), stationary (USD 5) and paint (USD 20). Opportunity cost of owners time is the federal minimun wage in Mexico: USD 4.30. We conclude the table with an estimate of the time required to recuperate program cost, given the \$116 gain in profits that operational firm owners experience at leats 24 months post-recruitment (form Panel A).



**While speaking conclusively about the general equilibrium effects of modernization programs is not possible, the study modernization interventions did not lead to sales losses for nearby control group firms in the same business line.** These control group firms experienced larger sales growth than those without a treated firm nearby even after controlling for neighborhood fixed effects and basic business characteristics. Thus, the study suggests that modernization programs can be viable investments for policy stakeholders in support of traditional retailers (though the study's primary goal is understanding academically whether and how modernization can be beneficial for an individual retailer).

## CONCLUSIONS

**This chapter addresses two novel research questions:** (1) What is the impact of modernization on the sales of traditional retailers? (2) Does externally focused modernization (visible to customers) differ from internally focused modernization (not visible to customers) in the way they impact the sales of traditional retailers?

**The study finds that there is a significant and persistent effect of both external modernization and internal modernization on firm sales.** Two years after the firm owners were recruited to participate in the program, firms in the external treatment group and internal treatment group had increased monthly sales by 18.7 percent and 15.5 percent, respectively. This analysis illustrates that modernization is beneficial to retail firms in Mexico City and that remaining traditional in external image as well as internal systems can be suboptimal for firms.

**This work also identifies the mechanisms that explain these sales gains and suggests that the sales increase occurred through different channels for externally modernizing firms and internally modernizing firms.** Externally modernizing firms improved their store-level branding. Internally modernizing firms did not improve their store-level branding, but they significantly improved in product management.

By establishing internal systems that tracked product-level demand, recorded margins, and managed flows of inventory, internally modernizing retailers were able to gain a deeper understanding of their products and make more informed decisions regarding their offerings.

**This study aims to inform and influence policy interventions to support small and informal women entrepreneurs in Mexico with a proven training package that could be scaled up nationally and then coupled with additional interventions (such as access to finance).** The results described above have implications for marketing researchers, policy makers, and marketing practitioners.

**Facilitating modernization through government programs could help expand economic activity in the retail sector, improve household incomes, and bring firms into the formal economy.** Despite this managerial and policy interest, no prior academic work has established the causal effect of modernization on the sales performance of retail firms, nor analyzed the mechanisms through which potential sales gains may occur. Some policy recommendations include the following:

- **Business modernization as a new policy objective for improving retail sector outcomes.** Consulting services in modernization have a concrete positive impact on retail sales performance.
- **Policy stakeholders can assist firms in modernizing by providing conditional grants and subsidies or developing modernization programs.** The study conducts a cost-benefit analysis showing that it might take the typical retail owner approximately six months to start realizing a positive return on the modernization investment.
- **Modernization programs can be viable investments for policy stakeholders to support traditional retailers** (though the study's primary goal is understanding academically whether and how modernization can be beneficial for an individual retailer).







# CHAPTER 3.

# GENDER SECTOR

# SEGREGATION

# AND CROSSING

# OVER

## INTRODUCTION

**This chapter presents results of a study assessing the benefits and determinants among women entrepreneurs who break sectoral barriers and enter man-dominated sectors.** Women often face fewer good income opportunities than men. At 44 percent, female labor force participation in Mexico is one of the lowest in the Latin America and the Caribbean region. To reveal factors that enable women to cross over to more profitable man-dominated sectors, this chapter analyses the differences in firm characteristics and performance between women entrepreneurs who operate businesses in more highly profitable man-dominated sectors and women entrepreneurs in traditional woman-concentrated sectors.

Using baseline survey data from a pilot program (chapter 1), this chapter aims to (1) investigate the differences in firm characteristics and performance between women who cross over and women who do not cross over into more profitable man-dominated sectors and (2) identify factors that enable women to cross over into these sectors. In the first case, the analysis focuses on discovering any significant differences in average profits among the two sets of women entrepreneurs. In the second case, the study identifies pivotal characteristics of women entrepreneurs who cross over and survive in more profitable man-dominated sectors.

**The chapter is divided into five sections.** It first presents a literature review. It then introduces the methodology

and results. The chapter concludes with a discussion of policy recommendations and the implications of the main results.

## LITERATURE REVIEW

**Across the globe, women often face less favorable income opportunities relative to men.** Women are less likely to participate in the labor market, and, if they do work, they usually earn less and are more likely to participate in less profitable activities. Similarly, woman-owned businesses tend to show weaker economic performance; on average, they are smaller, less profitable, and grow more slowly (Carranza, Dhakal, and Love 2018).

**Barriers may prevent women from starting businesses in high-performing man-dominated sectors and contribute to occupational gender segregation.** Household dynamics and time use may be constraining factors. Women usually bear a disproportionate share of housework and childcare responsibilities, have fewer choices in their movement and mobility, receive an unequal allocation of resources within the household, exhibit a tendency to invest loans or microfinance into the household instead of the business, rely on weaker social networks, and, in some cases, suffer intimate partner violence (de Mel, McKenzie, and Woodruff 2009; Jayachandran 2020; World Bank 2019).



**Preferences, motivations, and aspirations shaped by gender norms can also drive gender-specific constraints and labor market outcomes** (Dalton, Ghosal, and Mani 2016). A large portion of the gender gap in income and productivity can be explained by labor market frictions or gender norms that dictate the types of jobs women and men pursue and are able to obtain. For example, between 20 percent and 40 percent of productivity growth in the United States over the last five decades can be attributed to improved talent allocation, especially among women and black men (Hsieh et al. 2019). The resistance to formalization posed by the business and cultural barriers women microentrepreneurs face in engaging with business associations may be another factor that explains the profit gaps affecting women (Babbitt, Brown, and Mazaheri 2015; Benhassine et al. 2015; Demenet 2016; Jayachandran 2020).

**Men role models may also affect behavior by encouraging women entrepreneurs to apply the successful business practices of men or to make the decisions required for the businesses to succeed** (Bursztyn et al. 2014). Furthermore, exposure to a successful role model may provide information about the returns in man-dominated fields and help women gain market information (Field et al. 2016; Wilson 2012). Studies in specific settings suggest that a woman entrepreneur's decision to work in higher-return sectors may not be driven by differential access to education or finance, but by social factors, particularly the influence of men role models and exposure to the sector by family and friends. Recent evidence from a training program in Chile suggests that a role model intervention generates impacts similar to those of intensive technical assistance at a lower cost and may be more well suited for less highly experienced entrepreneurs (Lafortune, Riutort, and Tessada 2018).

**These factors also intensify other constraints that may affect women entrepreneurs, such as less access to credit, bank accounts, and collateral to grow their businesses or start a business in a capital-intensive sector** (Aterido, Beck, and Iacovone 2013; Klapper and Parker 2011). The constraints listed above may explain why women's choice of sector may be keeping women out of certain occupations and sectors and leading to a misallocation of talent across firms that may have implications for economic growth at the macrolevel.

**The choice of sector by women entrepreneurs is potentially driven by perceived social norms around what is acceptable for a woman to do in a particular culture** (de Mel, McKenzie, and Woodruff 2009). Women

entrepreneurs may choose to operate in sectors that require less mobility and allow for home-based work because doing so potentially allows more time flexibility, allowing women to manage their mobility restrictions, avoid harassment, and manage their burden of care (Carranza, Dhakal, and Love 2018; de Mel, McKenzie, and Woodruff 2009).

**Evidence shows that women entrepreneurs build larger and more profitable companies if they operate in man-dominated sectors.** Studies in Sub-Saharan Africa (Botswana, Ethiopia, and Uganda) and East Asia (Cambodia, Indonesia, Laos, and Vietnam) show that women entrepreneurs who cross over to man-dominated sectors perform much better than women in traditional sectors and as well as men in these higher-return sectors (Alibhai, Buehren, and Papineni 2015; Bardasi, Sabarwal, and Terrell 2011; Campos et al., 2015).<sup>12</sup> Woman-owned enterprises operating in man-dominated industries are as large and profitable as man-owned counterparts. They are also larger and more profitable than the enterprises in traditionally woman-dominated sectors (Goldstein, Gonzalez Martinez, and Papineni 2019). These studies also indicate that exposure to high-performing sectors can potentially lead women entrepreneurs to expand their opportunities.

**Mexico has one of the lowest female labor force participation rates (44 percent) and the third-largest gender gap in labor market participation (after Guatemala and Honduras) in the Latin America and the Caribbean region.**<sup>13</sup> Self-employment is the second most important type of employment (13.5 percent of the employed population).<sup>14</sup> And women account for 51 percent of the entrepreneurs in the country.<sup>15</sup> The ranking of women in entrepreneurial activities is high; the early-stage entrepreneurial rate among women is 21 percent of the adult population (Fairlie and Woodruff 2006). However, women tend to be overrepresented among microentrepreneurs, who often have limited access to productive resources and networks. Women entrepreneurs are also concentrated in few economic activities. Over 70 percent of their entrepreneurial activities are in wholesale and retail (Elam et al. 2019).<sup>16</sup>

**Using baseline survey data from a pilot program (chapter 1), this chapter aims to (1) investigate the differences in firm characteristics and performance between women who cross over and women who do not cross over into more profitable man-dominated sectors and (2) identify factors that enable women to cross over into these sectors.** In the first case, the analysis focuses on discovering any significant differences in average profits

<sup>12</sup> Country-level evidence on crossovers in Latin America is scarce.

<sup>13</sup> The female labor force participation rate in Mexico is the lowest among the region's largest economies. Rates are 49 percent in Argentina, 51 percent in Chile, 54 percent in Brazil, and 59 percent in Colombia. See Gender Data Portal (dashboard), World Bank, Washington, DC, <https://datatopics.worldbank.org/gender/>; ILOSTAT (dashboard), International Labour Organization, Geneva, <https://ilostat.ilo.org/>.

<sup>14</sup> 2016 data of ENIGH (Encuesta Nacional de Ingresos y Gastos de los Hogares, National Household Income and Expenditure Survey) (dashboard), Instituto Nacional de Estadística y Geografía (National Institute of Statistics and Geography), Aguascalientes, Mexico, <https://www.inegi.org.mx/programas/enigh/nc/>.

<sup>15</sup> 2014 data of ENAMIN (Encuesta Nacional de Micronegocios, National Survey of Microenterprises) (database), National Institute of Statistics and Geography, Aguascalientes, Mexico, <https://www.inegi.org.mx/programas/enamin/2012/?ps=microdatos>.



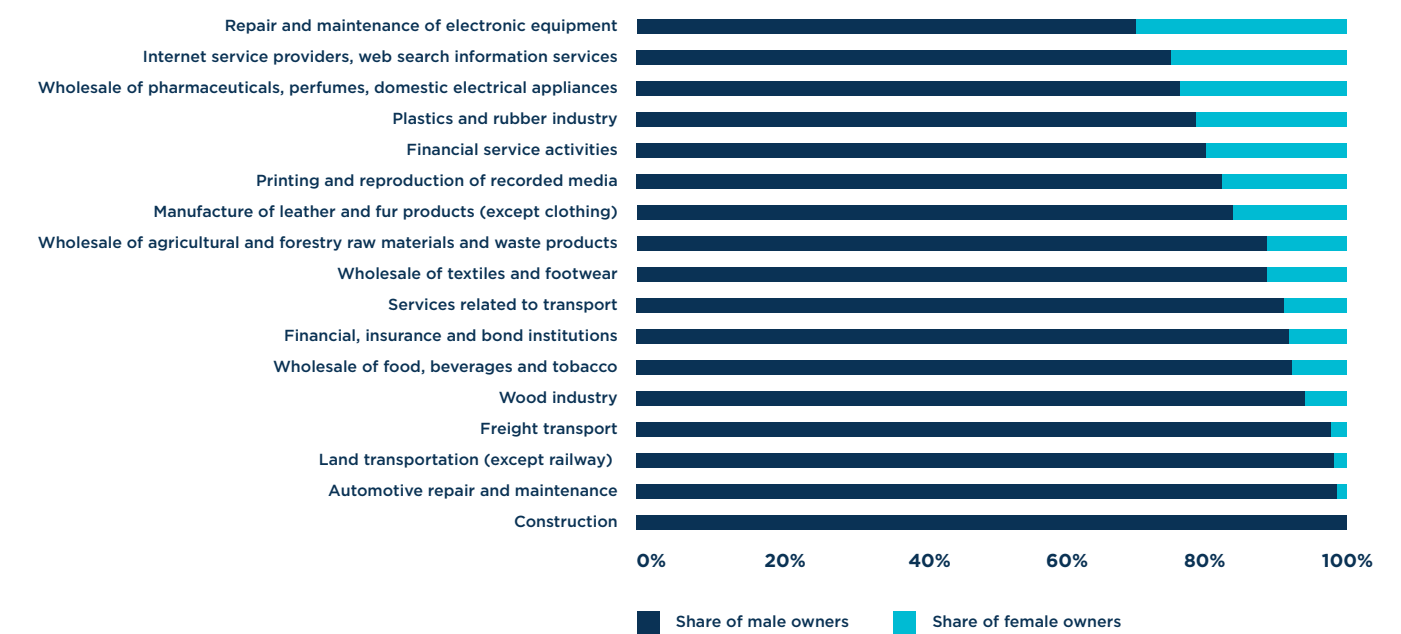
among the two sets of women entrepreneurs. In the second case, the study identifies pivotal characteristics of women entrepreneurs who cross over and survive in more profitable man-dominated sectors. To uncover factors that may help explain the ability of women entrepreneurs to cross over and succeed in man-dominated sectors, the study explores potential differences in household demographics, wealth status, cognitive and noncognitive skills, access to finance, and external influences to determine the drivers of gender segregation in Mexico. It also focuses on the effect of the presence of a role model or mentor, the effect of other features, such as cognitive and noncognitive skills, and the likelihood of women crossing over to man-dominated sectors. Finally, the study identifies policies that may be effective in supporting women entrepreneurs in crossing over.

**The existing literature often defines a man-dominated sector as a sector in which men own more than 50 percent of the firms or make up more than 50 percent of the employees.** Some studies use a threshold of 75 percent and draw on the responses of entrepreneurs to questions about their perceptions of the sex of the owners of most enterprises in their sectors (Alibhai et al. 2017; Campos et al. 2015; Goldstein, Gonzalez Martinez, and Papineni 2019; IWPR 2013).

**This study does not rely on perceptions, but the actual distribution of self-reported ownership by sex to classify man- or woman-dominated sectors.** It uses the distribution of self-reported ownership by sex in a nationally representative survey of microenterprises to classify sectors into man-dominated or woman-concentrated sectors. If more than 70 percent of businesses in the survey sample are owned by men, this study concludes that the sector is dominated by men. This definition has been applied to the sample of women entrepreneurs in the experimental baseline survey. There, if more than 70 percent of businesses in the entire sample are owned by men, the study defines the sector as man dominated.

**Based on this definition, 17 sectors have been classified as man dominated** (figure 3.1). Overall, man-dominated sectors in Mexico are capital intensive (automotive repair, land transportation, and mining), followed by sectors that require expertise in information and communication technology, finance, or stock market activities.

**FIGURE 3.1. SECTORS CLASSIFIED AS MAN DOMINATED**



## METHODOLOGY AND RESULTS

**The study first analyzes the determinants associated with crossing over.** By investigating these characteristics, the analysis attempts to uncover factors that might help explain the ability of women entrepreneurs to cross over and succeed in man-dominated sectors. The model includes factors that are defensible against reverse causality claims (parental education) as well as contemporaneous correlation with factors in the same framework (which may be a consequence of crossing over), as follows:

$$\text{Prob}(\text{crossover}_i) = C + x_i \cdot \beta + \varepsilon_i \quad (3.1)$$

The dependent variable is *crossover*, which is a dummy variable indicating whether a firm operates in a man-dominated sector.  $x_i$  is a vector of the characteristics of women entrepreneurs (mentoring, role model, and so on).

**The study then compares the business performance of crossovers and noncrossovers.** Apart from providing model-free evidence, the analysis presents results from the regression model specified as follows:

$$Y_i = C + \alpha * x_i + \beta * \text{crossover}_i + \varepsilon_i \quad (3.2)$$

$Y$  is the dependent variable of interest for firm  $i$ , for example, profits, sales, and so on.  $x_i$  is a vector of the characteristics of women entrepreneurs (mentoring, role model, and so on). The main explanatory variable is *crossover*, which is a dummy variable indicating whether a firm operates in a man-dominated sector.

**The results show that, in Mexico, on a range of indicators, woman-owned firms that cross over outperform woman-owned firms that do not cross over.** The woman-owned firms that operate in man-dominated sectors are nearly twice as profitable as the women-owned firms that remain in woman-dominated sectors. Similarly, the value of sales per day reported by women entrepreneurs in man-dominated sectors is more than double the value reported by women entrepreneurs in traditional sectors. Compared with noncrossovers, crossover firms are significantly larger according to average number of employees (0.7 versus 1.3). These data show that supporting women entrepreneurs who wish to enter man-dominated sectors fosters better firm performance.

**Opportunity entrepreneurs are more likely to cross over.** Some women start businesses because they see an opportunity, while other women start businesses out of necessity because they have no other options. According

to the data, women opportunity entrepreneurs typically started businesses because they (1) wanted to become independent, (2) had money and found a good business opportunity, or (3) wanted to advance their careers. Less than one entrepreneur in three (27 percent) was classified in this category. The results indicate that starting a business to take advantage of an opportunity is associated with a higher probability of entering a man-dominated sector. Moreover, evidence from a large sample of women entrepreneurs in Mexico suggests that, on average, opportunity entrepreneurs show higher profits and sales as well as better management practices than necessity entrepreneurs (Calderón, Iacovone, and Juárez 2017).



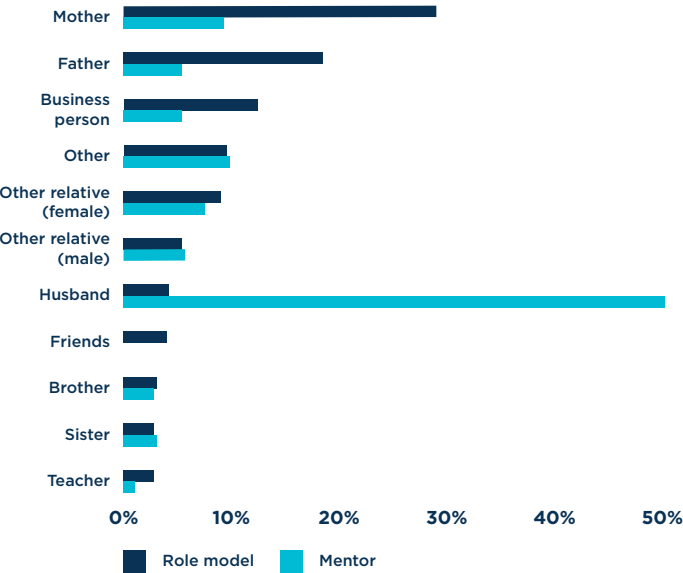
### The influence of a man role model or mentor

**Man role models encourage women entrepreneurs to cross over.** A role model is a person who serves as an example. In the study sample, 63 percent of women entrepreneurs who had crossed over reported that they had role models, compared with 54 percent of noncrossovers. Nearly two-thirds of the role models were a member of the family (figure 3.2). On average, 35 percent of the role models were men, and fathers were the most common man role models. If women entrepreneurs are supported by man role models, they are 6.5 percent more likely to cross over, compared with women who have no man role models.

**Man mentors positively impact women entrepreneurs and increase the likelihood they will cross over.** A mentor is a person who helps the entrepreneur to make important business decisions. In the study, 49 percent of crossovers and 46 percent of noncrossovers reported

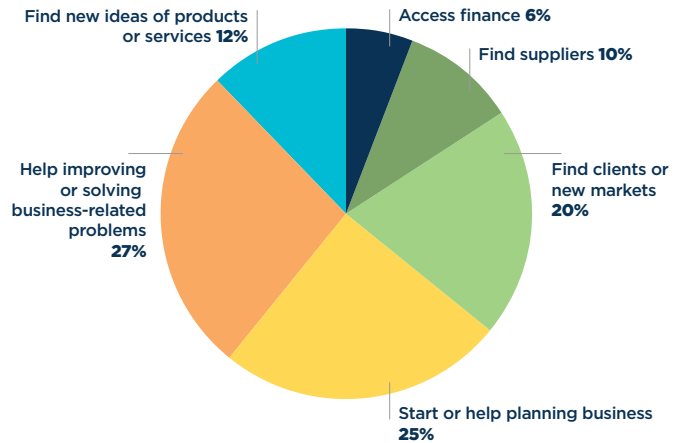
they had mentors.<sup>17</sup> More than 60 percent of the entrepreneurs reported they had had mentors for at least four years. Nearly two-thirds of the mentors were men, and most were the husbands or domestic partners of the women (figure 3.2). If man mentors support them, women are 5 percent more likely to cross over, relative to women not supported by man mentors. These results are consistent with the literature that shows that mentorship programs are more successful than formal classes, especially among microenterprises, for example, in Kenya (Brooks et al. 2018).

FIGURE 3.2. WHO ARE THE ROLE MODELS AND MENTORS?



**There are various reasons why man mentors matter.** The subset of crossover women who had man mentors reported that the mentors had helped them (1) improve their businesses or solve business problems (27 percent), (2) help them start or plan their businesses (25 percent), (3) find clients (20 percent), (4) find new ideas for products or services (12 percent), (5) find suppliers (10 percent), or (6) gain access to financing (7 percent) (figure 3.3).

FIGURE 3.3. MENTORS HAVE HELPED WOMEN ENTREPRENEURS, BY AREA OF ASSISTANCE



<sup>17</sup> The difference between crossovers and noncrossovers is not statistically significant in this case.



**Man mentors can unlock networking and financial opportunities.** Man mentors can help women entrepreneurs expand their social networks and gain visibility within a sector. They can also help them gain access to financing opportunities to grow their businesses. Among women entrepreneurs who reported they had mentors, women with man mentors had obtained, on average, 36 percent more credit during the year before the survey.

**Having a woman role model does not seem to have any significant impact on the likelihood of crossing over.** The results are in line with other studies on crossovers according to which early exposure to man role models is important in encouraging women entrepreneurs to enter man-dominated sectors. There are various ways in which mentors and role models can influence women to enter a man-dominated sector.

## Role models or mentors and firm performance

**Man role models and man mentors positively impact the likelihood of crossing over, but also foster business growth.** Estimates of the impact of a role model on key business performance indicators show that the availability of a role model has a positive effect, even after one controls for the impact of crossing over. Among women entrepreneurs who reported they had role models, the women with man role models showed, on average, 50 percent higher profits per week and 70 percent higher revenues per week. Man role models are also associated with higher levels of business activity (3.2 more working hours per week), even after one controls for crossing over. Among women entrepreneurs who reported they had mentors, the women with man mentors showed, on average, 29 percent higher profits and 35 percent higher revenues per week. They also had an average of 3.4 more clients and sold 12 more products per day.

## Other relevant determinants of crossing over

**The educational attainment of their fathers matters in women crossing over.** The study analyzed the effect of the educational attainment of the fathers and mothers of women entrepreneurs. It found that one additional year in a father's educational attainment increases the probability that a women entrepreneur crosses over to a man-dominated sector by 0.3 percent, after controlling for the woman's educational attainment, her mother's educational attainment, and cognitive skills. The effect of a mother's educational attainment is not statistically significant.

**Cognitive skills have a substantial effect on the likelihood of crossing over.** Crossovers seem to differ from noncrossovers on various measures of cognitive skills. Thus, one additional year of education is associated

with a 0.5 percent increase in the probability of crossing over. This implies that a women entrepreneur with secondary education will be 3 percentage points more likely than a women entrepreneur with only primary education to enter a man-dominated sector. Women entrepreneurs with substantial cognitive abilities, as measured through Raven's Progressive Matrices (a nonverbal test of abstract reasoning typically given in educational settings), are also 0.8 percent more likely to cross over (Tang et al. 2018). Meanwhile, noncognitive skills do not seem to affect the probability of choosing a man-dominated sector.

## CONCLUSIONS

**Woman-owned businesses tend to exhibit lower productivity, fewer profits, and less growth potential than man-owned businesses.** These differences may be explained by the nature of the sectors in which women operate. This chapter explores the differences in firm characteristics and performance between crossover and noncrossover women entrepreneurs and identifies the factors that enable women to cross over to more profitable, man-dominated sectors.

**The analysis shows that Mexican women entrepreneurs who cross over to man-dominated sectors perform better than noncrossovers on a range of indicators, including sales and profits.** Women entrepreneurs are more likely to cross over if man mentors or man role models support them. The results show that role models and mentors help women entrepreneurs cross over to man-dominated sectors, but also that they have a positive impact on the performance of woman-owned businesses.

**Understanding the factors that allow women to cross over into more profitable man-dominated sectors supports the design of interventions that enable women to develop businesses that reduce gender gaps in economic opportunities.** Rigorous evidence on what works in assisting women to cross over into man-dominated sectors is scarce, but promising. Some policy recommendations include the following:

- **Complement microentrepreneurship programs and exposure to man role models.** Standard microentrepreneurship programs that incorporate man role models can foster motivation and initiative. Exposure to a successful role model may provide information about the returns in man-dominated fields and help women gain market information (Field et al. 2016; Wilson 2012). Man role models can also affect behavior by incentivizing women entrepreneurs to apply the successful business practices of men or by encouraging women to make the decisions required for their businesses to succeed (Bursztyn et al. 2014). They can also provide introductions and network information and generally boost women's confidence about their fit in man-dominated sectors.

- **Evidence from a training program in Chile suggests that a role model intervention generates impacts similar to those of intensive technical assistance** at a lower cost and may be more well suited for less highly experienced entrepreneurs (Lafortune, Riutort, and Tessada 2018). In Indonesia, an intervention combining information on local best practices with exposure to successful role models led to significant improvements in sales and profits (Dalton et al. 2019). Building on the literature on the returns to education, future research could explore the effectiveness of using role models to socialize the expected returns in man-dominated sectors (Jensen 2010; Nguyen 2008).

- **Engage men in entrepreneurship training programs.** Microentrepreneurship programs could engage husbands and other men relatives to offset gender norms or attitudes that might constrain women from successful participation in the programs. Women entrepreneurs with man role models or man mentors (other than husbands) are more likely to cross over. Men could be encouraged to introduce women entrepreneurs to business networks, pass on key technical skills, and help the women gain access to financing opportunities.

- **Complement skills training programs with mentorship opportunities.** Networks among women entrepreneurs are often less widely available and less diverse, which places the women at a disadvantage. If they become part of skills training, men could become valuable as business partners or in providing support, thereby raising the likelihood that the women cross over to sectors with higher returns. Programs designed to empower women through skills training or cash grants may thus be more successful if they are combined with mentorship support (de Mel, McKenzie, and Woodruff 2009).

- **Incorporate smart designs in skills training programs.** **Skills training programs** might offer opportunities to improve outcomes among women entrepreneurs. However, because of family responsibilities, movement restrictions, and gender norms, it is often more difficult for women than men to access and complete such programs (Cho and Honorati 2013; Hicks et al. 2011). Although the precise skills needed are not yet clear, it is important that programs integrate smart designs that help women overcome constraints (World Bank 2020). Operational aspects include holding training in accessible and safe locations, arranging childcare options to help women participate as in the case of the Jóvenes en Acción Program in Colombia, and making transportation easy and safe as in the Peruvian Projoven jobs training program (Attanasio, Kugler, and Meghir 2009). These programs have shown long-term positive employment outcomes among both women and men.

- **Provide information on sector-specific profitability.**

Providing information about higher-return businesses in man-dominated sectors could change beliefs about profitability and encourage women to enter man-dominated fields. It may also motivate women to enroll in skills training in nontraditional trades. Information can be offered through career guidance in schools, informational sessions accompanying skills training programs, or edutainment (Bjorvatn et al. 2020). Efforts aimed at giving women entrepreneurs information about the differential returns in man-dominated sectors may matter, but there are few rigorous studies available, and the ones that are available are focused on lower-middle-income countries. For example, an intervention in Kenya used posters and handouts to display information on the returns to vocational education among women and men engaged in different fields of work. The information treatment encouraged women to prefer and ultimately enroll in man-dominated trades (Hicks et al. 2016).









# CHAPTER 4.

# HIGH-GROWTH

# WOMEN'S

# ENTREPRENEURSHIP

## INTRODUCTION

**Growth is generally agreed to be a goal of public policy, and it is considered a measure of entrepreneurial success.** High-growth businesses, whether led by women or men, are important for economic development because they are more likely to create jobs, achieve higher productivity, and innovate (Mason and Brown 2013). This topic is, however, characterized by a scarcity of theoretical and empirical research. Little is known about high-growth firms, and even less is known about their determinants and characteristics, especially woman-led high-growth firms.

**The empirical literature offers many definitions of what constitutes high growth.** According to Goswami, Medvedev, and Olafsen (2019), these definitions can be broadly grouped into absolute definitions, relative definitions, and distributional definitions. Absolute definitions set a minimum rate and duration of growth. For instance, a firm needs to rank at the top decile in employment growth for at least three years (Eurostat and OECD 2007; Lopez-Garcia and Puente 2012). Relative definitions classify high-growth firms as firms in the top percentiles in the distribution of employment or revenue growth. For example, some studies indicate that the growth in sales should be at least 20 percent a year (Dahlqvist, Davidsson, and Wiklund 2000). The distributional definitions combine features of absolute and relative definitions. In general, there is no consensus on one best measure. Scholars therefore suggest using a variety of indicators to measure overall performance.

**Similarly, there is no single framework to capture the determinants of high growth.** In general, two specific types of determinants are considered in the analysis of high-growth entrepreneurship. The first involves factors

that are specific to the firm. The second includes factors that are specific to the location or the sector in which the firm operates (see Goswami, Medvedev, and Olafsen 2019). For example, some studies emphasize that growth patterns are determined by the age and size of the firm, combined with the industry of operation or the environment (Dahlqvist, Davidsson, and Wiklund 2000; Gilbert, McDougall, and Audretsch 2006).

**While there is no consensus about what constitutes high growth or the determinants of high growth, the challenges woman-led businesses face are well documented in the empirical literature.** On average, woman-led businesses are smaller and less profitable and grow more slowly than man-led businesses (Carranza, Dhakal, and Love 2018). Many of the differences in performance can be explained by the sectors in which the woman-led businesses operate, typically retail (that is, small commerce) and a subset of services (Bardasi, Sabarwal, and Terrell 2011; Goldstein, Gonzalez Martinez, and Papineni 2019; Hallward-Driemeier 2013; Rijkers and Costa 2012; Rosa and Sylla 2016).

**Structural factors also contribute to the gender gap in business performance.** Women bear a disproportionate share of childcare and housework, have fewer choices in their movement and mobility, and face gender norms that limit their access to more profitable business opportunities (Babbitt, Brown, and Mazaheri 2015; Field et al. 2016; World Bank 2018). In some cases, depending on characteristics such as size, age, and sector, woman-led firms may have less access to credit, bank accounts, and collateral to grow their businesses (Aterido, Beck, and Iacovone 2013; Klapper and Parker 2011).

**The main objective of this chapter is to explore differences in the characteristics and performance of woman- and man-led firms eligible to apply and firms applying for the High-Impact Entrepreneurship Program (HIEP) in Mexico.** Deepening this understanding, the analysis focuses on differences in the characteristics and performance of woman-led businesses in man-dominated sectors compared with woman-led businesses in non-man-dominated sectors. By investigating these characteristics, the analysis aims to uncover factors that might help explain differences in performance. The next section presents a literature review on high-growth entrepreneurship, followed by a description of the data and results of the analysis. The last section concludes and provides policy recommendations.

## LITERATURE REVIEW

**Although the evidence on the determinants of high growth is mixed, the consensus is that the determinants are of two main types: (1) entrepreneur and firm characteristics and (2) environment and location** (Brush et al. 2004; Wright and Stigliani 2013). In general, firm growth is found to be related to specific firm characteristics, such as size and age (Audretsch 1995; Dunne, Roberts, and Samuelson 1988). For example, using data on over 11,000 firms in manufacturing, construction, trade, finance, and services in Germany, Harhoff, Stahl, and

Woywode (1998) examine how the performance of firms varies across sectors in terms of survival and growth. Their findings indicate that firm size is positively related to survival, but negatively correlated with growth. Arrighetti and Vivarelli (1999) report similar results using firm-level data on Italy.

**Another strand of the literature focuses on the link between firm performance and the characteristics of the entrepreneur.** Scholars have examined the effect of educational background, professional experience, and prior experience as an entrepreneur, or experience as an employee in a high-growth firm (Ács et al. 2009; Agarwal et al. 2004). All these characteristics are consistently found to have a positive impact on growth, particularly among small firms. The personalities of entrepreneurs also seem to matter. In particular, there is evidence that cognitive factors, such as aspirations and goals, have an impact on the scope of the business and, ultimately, affect growth potential (Baum and Locke 2004; Cassar 2007; Wiklund, Patzelt, and Shepherd 2009).

**A large body of research has also studied the effect on growth performance of the ability of firms to access resources.** There is extensive evidence suggesting that financial capital, in particular, is directly linked to high growth (Colombo and Grilli 2010; Dahlqvist, Davidsson, and Wiklund 2000). Similarly, social capital is a key factor in obtaining capital, particularly if access to formal financing is not an option (Florin, Lubatkin, and Schulze 2003). Furthermore, social capital can contribute to building a network of support that fosters growth (Liao and Welsch 2005).

**The effect on growth of the sector of operation and the location is also well researched.** The extent to which there are high or low entry barriers or growth among economic segments influences high growth (Baum, Locke, and Smith 2001). Almus and Nerlinger (2000) use panel data to examine the performance of new firms across sectors. Their findings indicate that growth rates in high-technology industries tend to be greater among new firms than among the high-technology industries or other manufacturing sectors. The geographical location is likewise a significant driver of growth, especially the level of development of the economy in the location. Regulatory, economic, and social conditions that vary across locations may foster or inhibit growth (Barringer, Jones, and Neubaum 2005; Hechavarria et al. 2019).

**The literature on high-growth firms is almost gender-blind.** While there is extensive evidence suggesting that women face specific challenges as entrepreneurs, little is known about the strategies they use to grow their businesses (Manolova et al. 2012; Morris et al. 2006). Overall, the lack of research on high-growth entrepreneurship among women is an obstacle to understanding the constraints on growth and threatens the effectiveness of policies aimed at fostering entrepreneurship (Jennings and Brush 2013).



## DATA AND RESULTS

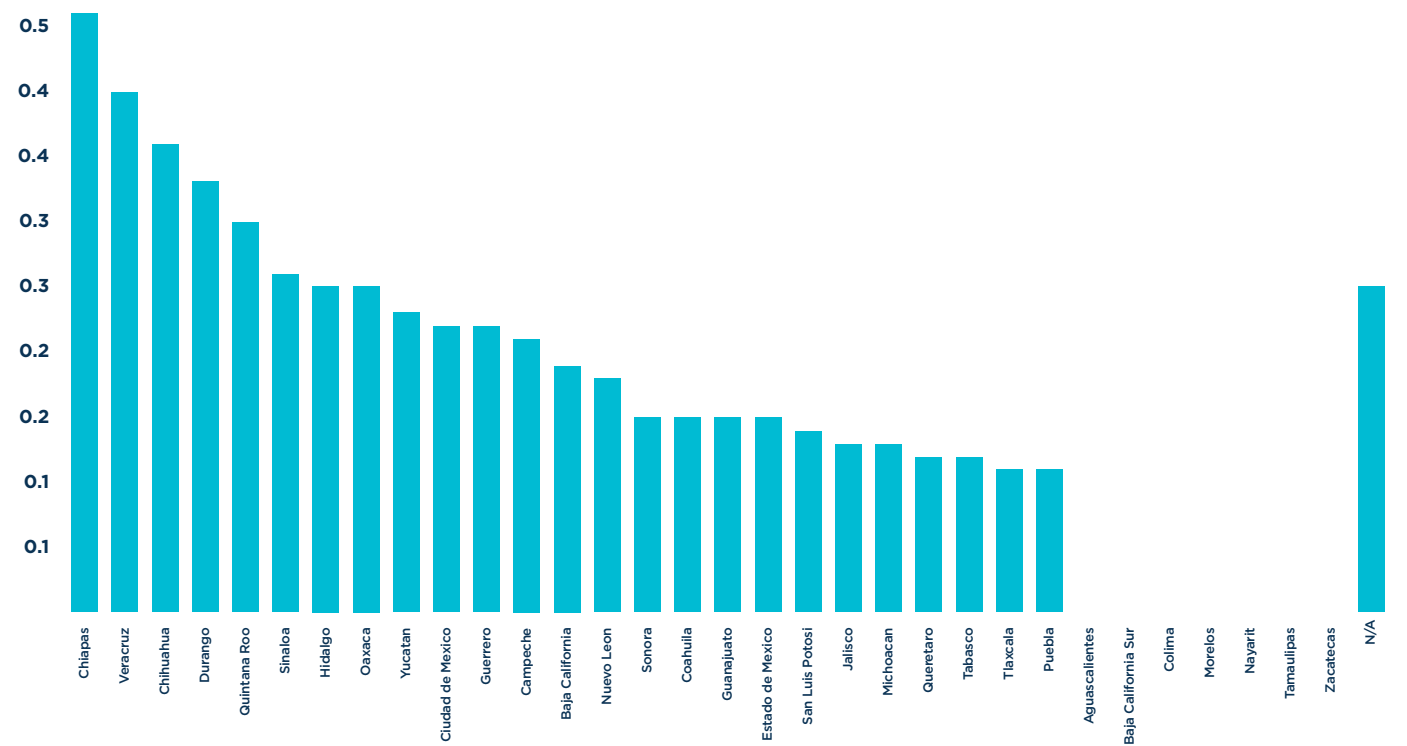
**The analysis uses administrative records and baseline survey data from a randomized controlled trial (chapter 1) to evaluate the impact of a matching-grant scheme to support SMEs with high economic growth potential in Mexico.** The HIEP also supports firms with high social and environmental impact and provides funding to eligible firms for up to Mex\$3 million (~US\$160,000) covering investment in four categories: (1) information technology and software, (2) certifications, (3) consulting and other professional services, and (4) machinery and equipment. Depending on the investment category, the government entity in charge, INADEM, grants 70 percent–80 percent of the amount requested, while the entrepreneur commits to financing the remaining portion of the investment.<sup>18</sup> The target firms are start-ups and more well established, but still young (scale-up) firms that offer an innovative product, service, or business model with substantial potential to compete globally and generate impact in economic, social, and environmental outcomes.

**Baseline survey data collection took place between November 2017 and January 2018.** It was led by CONEVAL, in collaboration with the World Bank. The survey reached 859 of the 996 firms that approved the

first review (documentation review) of INADEM, the government entity in charge of the HIEP. Most of the interviews were conducted face-to-face on the premises of the firms, and some surveys were conducted on Skype. Respondents were the chief executive officers (CEOs) of the firms (88 percent of the sample), the finance directors, or other directors familiar with operations. The survey collected information on key firm characteristics and performance indicators, such as innovation practices, research and development activities, access to finance, and business practices.

**An average of 25 percent of SMEs in Mexico are woman led.<sup>19</sup>** Woman-led firms represent approximately 19 percent of HIEP applications. Women’s representation in the pool of applicants also varies widely by state, but women are always a minority. For example, woman-led firms represent more than a third of all applicants in the states of Chiapas, Chihuahua, Durango, and Veracruz (figure 4.1), but less than 12 percent in Puebla and Tlaxcala. Moreover, woman-led firms are consistently underrepresented in the states with the largest concentration of applicants, that is, Jalisco, Mexico City, Nuevo León, where they account for fewer than 22 percent of the applications.

FIGURE 4.1. SHARE OF WOMAN-LED FIRMS THAT APPLIED FOR THE HIEP



Source: World Bank calculations based on INADEM administrative data and baseline survey data.

<sup>18</sup> Total HIEP funding reached Mex\$400 million (US\$22 million) in 2017 and was distributed among 171 firms.

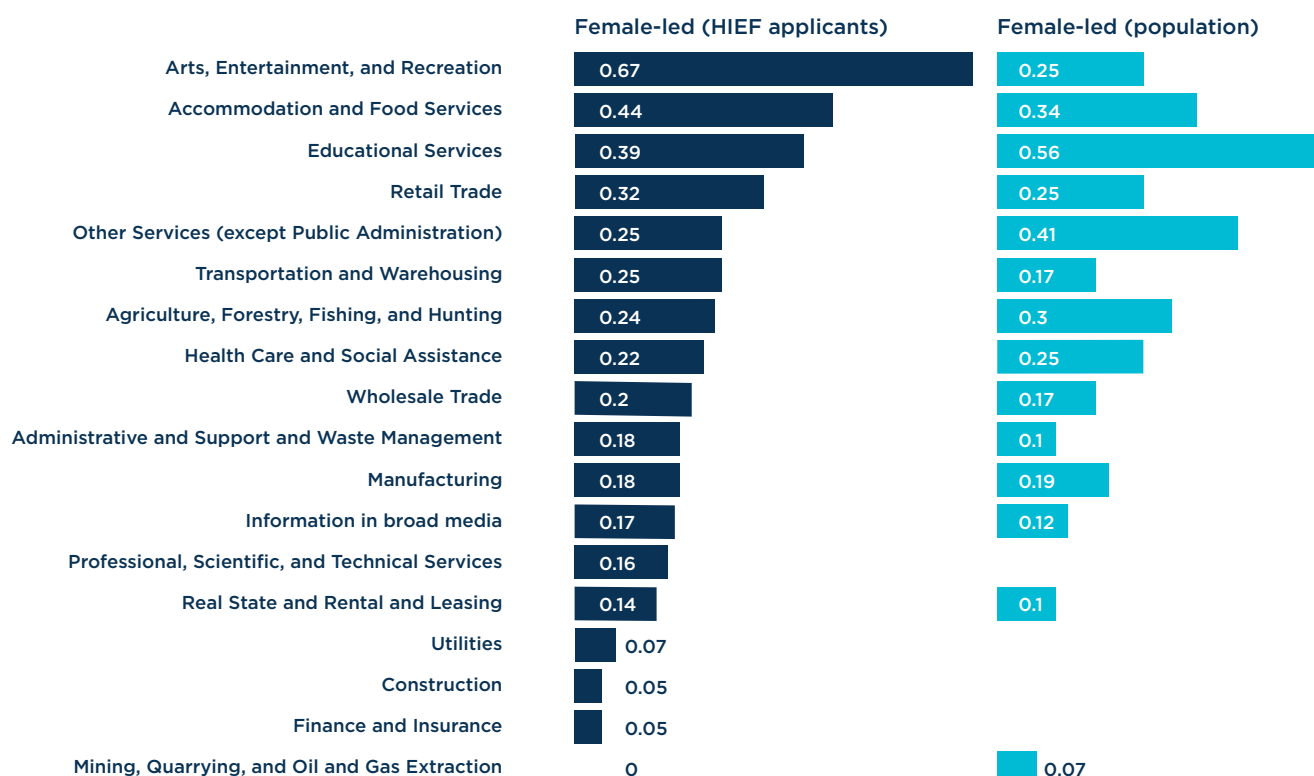
<sup>19</sup> 2015 data of ENAFIN (Encuesta Nacional de Financiamiento de las Empresas, National Survey of Enterprise Financing) (dashboard), National Institute of Statistics and Geography, Aguascalientes, Mexico, <https://www.inegi.org.mx/programas/enafin/2018/>.



**Among HIEP applicants, woman-led firms tend to be concentrated in specific service sectors.** Women's participation is particularly substantial in arts, entertainment, and recreation (67 percent), accommodation and food services (44 percent), and educational services (39 percent) (figure 4.2). This distribution largely resembles the patterns

observed in enterprises nationwide, which show that women's entrepreneurial activity is centered on the services industry, particularly education (56 percent), health care (41 percent), and accommodation and food services (34 percent).

**FIGURE 4.2. SHARE OF WOMAN-LED FIRMS, BY SECTOR**



Source: World Bank calculations based on INADEM administrative data and baseline survey data collected in 2017 and ENAFIN 2015.

## Characteristics of men and women ceos

**This section describes the differences in key characteristics of men and women leaders (CEOs, hereafter), including age, educational attainment, and years of professional experience.** The results that follow refer to the preferred specification, which includes sector fixed effects. Table 4.1, panel a, shows that, among all HIEP applicants, women CEOs are 1.5 years younger than their men counterparts (the men are around age 38). CEOs in the sample of applicants have on average 7.6 years of education, with no statistically significant difference between women and men CEOs. However, women leaders report slightly fewer years of professional experience (6.8 years versus 7.6 years).<sup>20</sup> After the sample has been restricted to HIEP-eligible firms, the results show no statistically significant differences in age

(37 years) or education (17 years) between women and men CEOs, but the gender gap in professional experience remains the same (6 years versus 8 years).

**Most CEOs report they have degrees in fields related to business administration, fewer report studies in the sciences and information technology.** Table 4.1, panel b, shows that 42 percent of women and men CEOs have degrees related to administration, with no significant gender differences. This is also the case among applicants with degrees in science (20 percent of the sample of applicants). In contrast, 12 percent of men CEOs have degrees related to information technology, compared with 7 percent of women CEOs. The sample of eligible applicants resembles these patterns, but differences between women

<sup>20</sup> Years of professional experience is estimated according to the professional experience reported on the applications. The information on 23 percent of the observations correspond to the leaders of the project, not the CEOs of the firms.

and men CEOs are wider among those with degrees related to information technology (3.8 percent versus 10.2 percent, respectively).

**There are few differences in access to finance among woman- and man-led firms.** Table 4.1, panel c, illustrates the analysis of gender differences in access to finance using three different proxies (dichotomous variables): (1) whether the firm would have access to Mex\$1 million (~US\$500,000), (2) whether the firm would obtain financing from formal sources (banks, private loans,

suppliers), and (3) whether the firm had obtained a loan in the last year. Estimates show no statistically significant differences between woman- and man-led firms on any of the indicators, except for the gap in loans obtained the year prior to the survey. Whereas 23 percent of firm applicants with a man CEO obtained a loan in 2017, only 16 of the woman-led firms did so. This indicator, however, should be used with caution because it is not representative of limited access to finance. Firms may not have needed or requested loans.





**TABLE 4.1. GENDER DIFFERENCES IN THE CHARACTERISTICS OF FIRM LEADERS**

**A. Age, education, and experience**

	<b>1</b> OLS-ALL	<b>2</b> OLS-ALL	<b>3</b> OLS-ALL	<b>4</b> OLS-ALL	<b>5</b> OLS-ALL	<b>6</b> OLS-ALL
<b>VARIABLES</b>	<b>AGE</b>	<b>AGE</b>	<b>YEARS EDUCATION</b>	<b>YEARS EDUCATION</b>	<b>YEARS PROF. EXP</b>	<b>YEARS PROF. EXP</b>
CEO_Female	-1.461** (0.680)	-1.532** (0.723)	0.176 (0.133)	0.162 (0.143)	-0.723 (0.483)	-0.826* (0.490)
Constant	37.589*** (0.300)	37.602*** (0.301)	17.134*** (0.062)	17.137*** (0.061)	7.601*** (0.229)	7.620*** (0.229)
Observations	914	914	902	902	914	914
R-squared	0.005	0.112	0.002	0.116	0.002	0.117
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

	<b>7</b> OLS-ELIGIBLE	<b>8</b> OLS-ELIGIBLE	<b>9</b> OLS-ELIGIBLE	<b>10</b> OLS-ELIGIBLE	<b>11</b> OLS-ELIGIBLE	<b>12</b> OLS-ELIGIBLE
<b>VARIABLES</b>	<b>AGE</b>	<b>AGE</b>	<b>YEARS EDUCATION</b>	<b>YEARS EDUCATION</b>	<b>YEARS PROF. EXP</b>	<b>YEARS PROF. EXP</b>
CEO_Female	-0.825 (1.138)	-1.346 (1.429)	0.216 (0.252)	0.127 (0.293)	-1.990*** (0.596)	-2.437*** (0.831)
Constant	37.542*** (0.477)	37.626*** (0.472)	17.293*** (0.104)	17.308*** (0.107)	7.953*** (0.372)	8.025*** (0.381)
Observations	327	327	326	326	327	327
R-squared	0.002	0.284	0.002	0.219	0.016	0.234
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**NOTES:** 1. Includes only applications reviewed by both experts & traditional according to INADEM rules



## B. Field of education

	1 OLS-ALL	2 OLS-ALL	3 OLS-ALL	4 OLS-ALL	5 OLS-ALL	6 OLS-ALL
VARIABLES	IT	IT	SCIENCE	SCIENCE	ADMIN	ADMIN
CEO_Female	-0.054** (0.023)	-0.055** (0.027)	-0.050 (0.031)	-0.021 (0.032)	0.072* (0.042)	0.050 (0.044)
Constant	0.124*** (0.012)	0.124*** (0.012)	0.201*** (0.015)	0.195*** (0.014)	0.422*** (0.018)	0.426*** (0.018)
Observations	914	914	914	914	914	914
R-squared	0.004	0.091	0.002	0.174	0.003	0.143
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

	7 OLS-ELIGIBLE	8 OLS-ELIGIBLE	9 OLS-ELIGIBLE	10 OLS-ELIGIBLE	11 OLS-ELIGIBLE	12 OLS-ELIGIBLE
VARIABLES	IT	IT	SCIENCE	SCIENCE	ADMIN	ADMIN
CEO_Female	-0.064** (0.032)	-0.065 (0.049)	-0.027 (0.059)	-0.005 (0.078)	0.046 (0.075)	0.052 (0.094)
Constant	0.102*** (0.018)	0.102*** (0.019)	0.215*** (0.025)	0.212*** (0.024)	0.464*** (0.030)	0.463*** (0.030)
Observations	327	327	327	327	327	327
R-squared	0.007	0.141	0.001	0.285	0.001	0.259
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## C. Access to finance

	1 OLS-ALL	2 OLS-ALL	3 OLS-ALL	4 OLS-ALL	5 OLS-ALL	6 OLS-ALL
VARIABLES	ACCESS_1MIL_1(Y/N)	ACCESS_1MIL_1(Y/N)	ACCESSFIN_FORMAL_YN	ACCESSFIN_FORMAL_YN	LOANS2017_YN	LOANS2017_YN
CEO_Female	-0.007 (0.022)	-0.005 (0.021)	0.065 (0.045)	0.036 (0.047)	-0.078 (0.035)	-0.083** (0.040)
Constant	0.946*** (0.009)	0.945*** (0.009)	0.554*** (0.020)	0.560*** (0.020)	-0.236*** (0.017)	0.237*** (0.017)
Observations	791	791	791	791	791	791
R-squared	0.000	0.106	0.003	0.123	0.005	0.120
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

	7 OLS-ELIGIBLE	8 OLS-ELIGIBLE	9 OLS-ELIGIBLE	10 OLS-ELIGIBLE	11 OLS-ELIGIBLE	12 OLS-ELIGIBLE
VARIABLES	ACCESS_1MIL_1(Y/N)	ACCESS_1MIL_1(Y/N)	ACCESSFIN_FORMAL_YN	ACCESSFIN_FORMAL_YN	LOANS2017_YN	LOANS2017_YN
CEO_Female	-0.024 (0.041)	-0.022 (0.049)	0.090 (0.075)	0.059 (0.090)	-0.043 (0.065)	-0.047 (0.092)
Constant	0.944*** (0.014)	0.944*** (0.015)	0.530*** (0.030)	0.535*** (0.031)	0.263*** (0.027)	0.264*** (0.028)
Observations	320	320	320	320	320	320
R-squared	0.001	0.185	0.004	0.247	0.001	0.222
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Bank calculations based on INADEM administrative data and baseline survey data.

## Gender differences in hiep eligibility

**This section uses administrative records and baseline survey data to analyze gender differences in scores among all applicants and in the sample of eligible firms.**

Table 4.2 shows that, among the pool of applicants, woman-led firms obtained, on average, a score that was lower by 1.3 points compared with man-led firms. However, the effect is no longer significant in controlling for sector fixed effects. In contrast, if the sample is restricted only to firms eligible for the HIEP, the gender gap in scores (against woman-led firms) increases to 2.0 points, even after the controls for sector fixed effects.

**To what extent does the sex of the reviewer matter?**

Table 4.2, columns 3 and 4, include interaction terms between the sex of the CEO and the sex of the application reviewer. Estimates suggest that, on average, women reviewers tend to assign higher scores, compared with their men counterparts. The interaction coefficient, that is, matching woman-led firms with women reviewers, however, is not statistically significant. After restricting the sample to only firms eligible for the program and after controlling for sector effects, the estimates confirm that women reviewers tend to assign higher scores compared with men reviewers. And the results for this group of firms suggest that an eligible firm will score 3.6 points lower if both the reviewer and the CEO are women (column 8).

**TABLE 4.2. GENDER DIFFERENCES IN FIRM SCORES**

	1	2	3	4	5	6	7	8
	OLS-ALL	OLS-ALL	OLS-ALL	OLS-ALL	OLS-ELIGIBLE	OLS-ELIGIBLE	OLS-ELIGIBLE	OLS-ELIGIBLE
VARIABLES	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE
CEO_Female	-1.319** (0.615)	-1.047 (0.646)	-1.000 (0.759)	-0.782 (0.773)	-1.004 (0.900)	-1.893* (1.067)	0.054 (1.106)	-0.876 (1.285)
EV_Female			1.346*** (0.562)	1.169** (0.560)			2.273*** (0.763)	1.932** (0.764)
CEO_Female *EV_Female			-1.078 (1.324)	-0.945 (1.317)			-3.754* (1.978)	-3.585* (2.123)
Constant	71.239*** (0.513)	71.115*** (0.513)	70.862*** (0.546)	70.790*** (0.547)	79.413*** (0.797)	79.512*** (0.781)	78.881*** (0.830)	79.058*** (0.817)
Observations	4,303	4,303	4,241	4,241	1,512	1,512	1,485	1,485
R-squared	0.048	0.085	0.047	0.084	0.043	0.088	0.047	0.091
Type of reviewer fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**NOTES:**

1. Includes only applications reviewed by both experts & traditional according to INADEM rules
2. Omitted category: volunteer reviewers

Source: World Bank calculations based on INADEM administrative data and baseline survey data.

## Gender differences in performance

**Differences in the performance of woman- and man-led firms are measured in a number of ways including total revenue, sales, profits, employment, investments in tangible assets, and the value of assets.<sup>21</sup>** Even though gender differences in key characteristics of woman- and man-led firms are small (or not significant), the estimates in table 4.3 show that, even after controlling for sector fixed

effects, on average, firms with a woman CEO fare worse in some of these measures of performance.

**On average, a woman-led firm makes Mex\$4 million less than a man-led firm in sales revenue** (panel a, columns 1, 2, 7, and 8). This gender gap is consistent across all applicant firms and the smaller sample of only eligible firms, and the difference increases after controlling for sector of operation. Similarly, there is a negative relationship between the presence of a woman CEO and

<sup>21</sup> Firm performance indicators such as investment and employment have been transformed using the Winsor method to limit extreme values.

the number of employees. On average, woman-led firms have five fewer employees than man-led firms. The average firm earns Mex\$1.3 million in profits, but gender differences are not statistically significant.

**Gender gaps in reported investment and the value of assets are substantial.** Table 4.3, panel b, shows that the value of investment and of the assets of the average woman-led firm is significantly lower compared with the average man-led firm, even after controlling for sector fixed effects. The gap is especially large among firms eligible for the HIEP.

**Woman-led firms are significantly less likely than man-led firms to invest in research and development.** The analysis explores gender differences in three indicators of performance: (1) expenditure on research

and development, (2) whether the firm has developed new or improved products, and (3) whether the firm has introduced new marketing practices. The estimates in table 4.3, panel c, reveal gaps in a few areas of innovation. Woman-led firms spend 47 percent less than man-led firms on research and development, but gender differences in the proportion of firms that introduced new or significantly improved products, processes, or marketing strategies are not statistically significant. Panel d presents the estimated gender differences on additional firm behavior indicators related to management, such as the proportion of firms with process certifications, whether the firm has a website, and whether the business is family owned. Gender differences are not statistically significant for any of the indicators or specifications.





**TABLE 4.3. GENDER DIFFERENCES IN FIRM PERFORMANCE, 2017**

**A. Revenues, profits, and number of employees**

	<b>1</b> OLS-ALL	<b>2</b> OLS-ALL	<b>3</b> OLS-ALL	<b>4</b> OLS-ALL	<b>5</b> OLS-ALL	<b>6</b> OLS-ALL
VARIABLES	REVENUE (000 MXN)	REVENUE (000 MXN)	PROFITS (000 MXN)	PROFITS (000 MXN)	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYEES
CEO_Female	-3,941.98*** (1,316.29)	-4,457.17*** (1,382.06)	-373.86 (232.02)	-242.68 (246.07)	-4.91*** (1.25)	-4.75*** (1.40)
Constant	11,101.75*** (699.67)	11,197.90*** (672.96)	1,336.93*** (119.60)	1,312.55*** (116.47)	15.90*** (0.71)	15.87*** (0.69)
Observations	793	793	791	791	793	793
R-squared	0.008	0.191	0.002	0.151	0.012	0.165
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

	<b>7</b> OLS-ELIGIBLE	<b>8</b> OLS-ELIGIBLE	<b>9</b> OLS-ELIGIBLE	<b>10</b> OLS-ELIGIBLE	<b>11</b> OLS-ELIGIBLE	<b>12</b> OLS-ELIGIBLE
VARIABLES	REVENUE (000MXN)	REVENUE (000MXN)	PROFITS (000 MXN)	PROFITS (000 MXN)	NUMBER OF EMPLOYEES	NUMBER OF EMPLOYEES
CEO_Female	-3.972.87* (2,318.64)	-4,248.14* (2,521.18)	-618.73 (434.07)	-279.32 (531.61)	-3.52 (2.13)	-3.07 (2.54)
Constant	12,228.23*** (1,168.82)	12,271.96*** (1,117.70)	1,526.55*** (202.11)	1,472.63*** (199.27)	16.20*** (1.10)	16.13*** (1.06)
Observations	321	321	321	321	321	321
R-squared	0.006	0.367	0.005	0.282	0.006	0.299
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**B. Investment and value of assets**

	<b>1</b> OLS-ALL	<b>2</b> OLS-ALL	<b>3</b> OLS-ALL	<b>4</b> OLS-ALL	<b>5</b> OLS-ALL	<b>6</b> OLS-ALL	<b>7</b> OLS-ELIGIBLE	<b>8</b> OLS-ELIGIBLE
VARIABLES	INVESTMENT (000 MXN)	INVESTMENT (000 MXN)	VALUE OF ASSETS (000 MXN)	VALUE OF ASSETS (000 MXN)	INVESTMENT (000 MXN)	INVESTMENT (000 MXN)	VALUE OF ASSETS (000 MXN)	VALUE OF ASSETS (000 MXN)
CEO_Female	-200.15** (83.53)	-187.31* (97.33)	-987.36*** (292.85)	-1,019.25*** (328.91)	-295.22** (138.63)	-297.01 (216.31)	-1,435.46*** (450.28)	-1,703.17** (684.73)
Constant	707.79*** (43.35)	705.39*** (42.28)	2,354.65*** (165.04)	2,360.60*** (153.95)	736.50*** (66.23)	736.79*** (67.48)	2,491.60*** (256.93)	2,534.13*** (258.99)
Observations	793	793	793	793	321	321	321	321
R-squared	0.005	0.165	0.009	0.233	0.010	0.244	0.017	0.321
Sector Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### C. Innovation

	1 OLS-ALL	2 OLS-ALL	3 OLS-ALL	4 OLS-ALL	5 OLS-ALL	6 OLS-ALL	7 OLS-ALL	8 OLS-ALL
VARIABLES	R&D (000 MXN)	R&D (000 MXN)	NEW PRODUCT	NEW PRODUCT	NEW PROCESS	NEW PROCESS	NEW MARKETING	NEW MARKETING
CEO_Female	-224.42*** (64.01)	-224.33*** (72.04)	-0.07 (0.04)	-0.04 (0.05)	-0.03 (0.05)	-0.00 (0.05)	-0.00 (0.04)	-0.06 (0.05)
Constant	531.99*** (34.20)	531.97*** (35.15)	0.70*** (0.02)	0.70*** (0.02)	0.47*** (0.02)	0.46*** (0.02)	0.59*** (0.02)	0.60*** (0.02)
Observations	770	770	793	793	793	793	793	793
R-squared	0.011	0.093	0.003	0.111	0.001	0.114	0.000	0.103
Sector Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

	9 OLS-ALL	10 OLS-ALL	11 OLS-ALL	12 OLS-ALL	13 OLS-ALL	14 OLS-ALL	15 OLS-ALL	16 OLS-ALL
VARIABLES	R&D (000 MXN)	R&D (000 MXN)	NEW PRODUCT	NEW PRODUCT	NEW PROCESS	NEW PROCESS	NEW MARKETING	NEW MARKETING
CEO_Female	-288.40** (119.73)	-289.02* (149.40)	-0.15** (0.07)	-0.11 (0.09)	0.03 (0.08)	0.08 (0.10)	0.05 (0.07)	-0.03 (0.09)
Constant	617.26*** (54.49)	617.35*** (57.59)	0.76*** (0.03)	0.75*** (0.03)	0.50*** (0.03)	0.49*** (0.03)	0.66*** (0.03)	0.67*** (0.03)
Observations	310	310	321	321	321	321	321	321
R-squared	0.014	0.216	0.016	0.220	0.000	0.210	0.002	0.241
Sector Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### D. Other indicators

	1 OLS-ALL	2 OLS-ALL	3 OLS-ALL	4 OLS-ALL	5 OLS-ALL	6 OLS-ALL
VARIABLES	CERTIFICATION _YN	CERTIFICATION _YN	WEBSITE_YN	WEBSITE_YN	FAMILY OWNED BUSINESS	FAMILY OWNED BUSINESS
CEO_Female	-0.08* (0.04)	-0.05 (0.05)	-0.04 (0.04)	-0.04 (0.04)	0.02 (0.02)	0.03 (0.02)
Constant	0.41*** (0.02)	0.40*** (0.02)	0.75*** (0.02)	0.75*** (0.02)	0.05*** (0.01)	0.05*** (0.01)
Observations	793	793	914	914	793	793
R-squared	0.004	0.124	0.001	0.121	0.001	0.153
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

	7 OLS-ELIGIBLE	8 OLS-ELIGIBLE	9 OLS-ELIGIBLE	10 OLS-ELIGIBLE	11 OLS-ELIGIBLE	12 OLS-ELIGIBLE
VARIABLES	CERTIFICATION _YN	CERTIFICATION _YN	WEBSITE_YN	WEBSITE_YN	FAMILY OWNED BUSINESS	FAMILY OWNED BUSINESS
CEO_Female	-0.08 (0.07)	-0.10 (0.09)	0.07 (0.05)	0.08 (0.06)	-0.00 (0.04)	0.01 (0.05)
Constant	0.45*** (0.03)	0.45*** (0.03)	0.80*** (0.02)	0.80*** (0.02)	0.06*** (0.01)	0.06*** (0.01)
Observations	321	321	327	327	321	321
R-squared	0.003	0.253	0.004	0.277	0.000	0.280
Sector Fixed Effects	No	Yes	No	Yes	No	Yes

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## A firm's sector of operation matters

### **This section explains differences in firm performance.**

The analysis focuses on differences in the characteristics and performance of woman-led firms operating in man-dominated sectors, compared with the corresponding performance in non-man-dominated sectors.

### **The classification of firms according to their activities in man- or non-man-dominated sector is not well established.**

The literature often defines a man-dominated sector as a sector in which men own more than 50 percent of the firms or make up more than 50 percent of the employees. Some studies use a threshold of 75 percent and draw on the responses of entrepreneurs to questions about their perceptions of the sex of the owners of most enterprises in their sectors (Alibhai et al. 2017; Campos et al. 2015; Goldstein, Gonzalez Martinez, and Papineni 2019).

### **The analysis relies on the distribution of CEOs by sex in the baseline survey to classify sectors into man-dominated or non-man-dominated.**

If more than 80 percent of the firms in the survey have men CEOs, this study defines the sector as man dominated. This definition is then applied to the woman-led firms in the sample. Based on this definition, 45 of the 74 sectors (60 percent) have been classified as man dominated. Furthermore, 98 of the 172 woman-led firms in the sample (57 percent) operate in man-dominated sectors.

### **Overall, the differences between woman-led firms operating in man-dominated sectors and their counterparts operating in non-man-dominated sectors (as well as their CEOs) are not statistically significant.**

Table 4.4, panel a, shows that, for the full sample of applicants, these two groups of firms (and their CEOs) only differ in a few areas. First, consistent with the findings in previous sections, most women CEOs have degrees related to business administration. Only 10 percent of women CEOs operating firms in man-dominated sectors hold degrees related to information technology, while, in non-man-dominated sectors, the share is only 3 percent. Second, woman-led firms operating in man-dominated sectors are more likely than their counterparts in non-man-dominated sectors to have introduced new or substantially improved products (71 percent versus 57 percent, respectively). However, the share of firms that introduced new marketing strategies is 15 percentage points higher among the firms operating in non-man-dominated sectors. Among the pool of eligible firms, differences between these two groups are not statistically significant, except for product innovation, where the differences in the introduction of improved products are even more marked (74 percent versus 50 percent).





TABLE 4.4. CHARACTERISTICS OF CEOS AND THEIR FIRMS IN MAN- AND NON-MAN-DOMINATED SECTORS

## A. All firms

		1		2		T-TEST
VARIABLES		NON-MALE DOMINATED SECTOR N	MEAN/SE	NON-MALE DOMINATED SECTOR N	MEAN/SE	(1) - (2) P-VALUE
CEO CHARACTERISTICS	CEO Age	88	36.176 (0.857)	84	36.077 (0.877)	0.936
	CEO Education (years)	87	17.264 (0.171)	84	17.357 (0.164)	0.696
	Professional experience (years)	88	7.420 (0.677)	84	6.310 (0.506)	0.190
EDUCATION FIELD	IT	88	0.034 (0.019)	84	0.107 (0.034)	0.064*
	Science	88	0.159 (0.039)	84	0.143 (0.038)	0.768
	Admin	88	0.534 (0.053)	84	0.452 (0.055)	0.287
ACCESS TO FINANCE	Access to 1 mil_yn (proportion)	76	0.908 (0.033)	71	0.972 (0.020)	0.102
	Access to formal sources _yn (proportion)	76	0.632 (0.056)	71	0.606 (0.058)	0.748
	Loans in 2017_yn (proportion)	75	0.120 (0.038)	71	0.197 (0.048)	0.206
FIRM PERFORMANCE	Revenue 2017 (000 MXN)	76	7615.017 (1543.748)	72	6679.234 (1627.676)	0.677
	Profits 2017 (000 MXN)	75	737.359 (237.866)	72	1198.183 (322.064)	0.252
	Number of employees	76	10.816 (1.178)	72	11.181 (1.711)	0.861
	Investment 2017 (000 MXN)	76	442.452 (89.109)	72	576.448 (113.158)	0.354
	Value of assets 2017 (000 MXN)	76	1130.979 (327.340)	72	1616.717 (359.086)	0.319
INNOVATION	R&D (000 MXN)	72	236.176 (68.559)	68	383.154 (84.394)	0.179
	Firm developed/introduced new product	76	0.566 (0.057)	72	0.708 (0.054)	0.072*
	Firm developed/implemented new process	76	0.474 (0.058)	72	0.403 (0.058)	0.388
	Firm developed/introduced new marketing strategy	76	0.658 (0.055)	72	0.514 (0.059)	0.077*
OTHER BUSINESS PRACTICES	Firm-Certification in process or granted	76	0.303 (0.053)	72	0.361 (0.057)	0.454
	Firm has a website	88	0.750 (0.046)	84	0.667 (0.052)	0.232
	Firm is majority owned by director's family or employee's family	76	0.066 (0.029)	72	0.083 (0.033)	0.688

The value displayed for t-tests are p-values. Standard errors are robust. \*\*\*, \*\* and \* indicate significance at the 1, 5, and 10 percent

## B. Eligible firms

		1		2		T-TEST
VARIABLES		NON-MALE DOMINATED SECTOR		MALE DOMINATED SECTOR		(1) - (2)
		N	MEAN/SE	N	MEAN/SE	P-VALUE
CEO CHARACTERISTICS	CEO Age	29	35.448 (1.097)	24	38.250 (1.854)	0.199
	CEO Education (years)	29	17.517 (0.339)	24	17.500 (0.313)	0.970
	Professional experience (years)	29	6.103 (0.602)	24	5.792 (0.749)	0.747
EDUCATION FIELD	IT	29	0.000 (0.000)	24	0.083 (0.058)	0.153
	Science	29	0.207 (0.077)	24	0.167 (0.078)	0.714
	Admin	29	0.517 (0.094)	24	0.500 (0.104)	0.903
ACCESS TO FINANCE	Access to 1 mil_yn (proportion)	28	0.929 (0.050)	22	0.909 (0.063)	0.808
	Access to formal sources _yn (proportion)	28	0.643 (0.092)	22	0.591 (0.107)	0.715
	Loans in 2017_yn (proportion)	28	0.179 (0.074)	22	0.273 (0.097)	0.443
FIRM PERFORMANCE	Revenue 2017 (000 MXN)	28	8669.429 (2742.937)	23	7751.282 (3036.774)	0.823
	Profits 2017 (000 MXN)	28	382.653 (295.154)	23	1547.162 (768.004)	0.163
	Number of employees	28	12.714 (2.206)	23	12.652 (3.139)	0.987
	Investment 2017 (000 MXN)	28	435.043 (168.234)	23	448.872 (182.937)	0.956
	Value of assets 2017 (000 MXN)	28	691.530 (279.019)	23	1500.017 (752.263)	0.318
INNOVATION	R&D (000 MXN)	27	268.177 (126.035)	20	410.782 (188.886)	0.532
	Firm developed/introduced new product	28	0.500 (0.096)	23	0.739 (0.094)	0.081*
	Firm developed/implemented new process	28	0.500 (0.096)	23	0.565 (0.106)	0.650
	Firm developed/introduced new marketing strategy	28	0.786 (0.079)	23	0.609 (0.104)	0.181
OTHER BUSINESS PRACTICES	Firm-Certification in process or granted	28	0.357 (0.092)	23	0.391 (0.104)	0.807
	Firm has a website	29	0.862 (0.065)	24	0.875 (0.069)	0.892
	Firm is majority owned by director's family or employee's family	28	0.036 (0.036)	23	0.087 (0.060)	0.466

The value displayed for t-tests are p-values. Standard errors are robust. \*\*\*, \*\* and \* indicate significance at the 1, 5, and 10 percent

Source: World Bank calculations based on INADEM administrative data and baseline survey data.

To verify the robustness of these results to the definition of sector of operation, the analysis that follows uses the nationally representative sample of ENAFIN to reclassify sectors into man- or strongly man-dominated and then apply this definition to the sample from the baseline survey. In this exercise, a man-dominated sector is defined as sector in which men manage more than 50 percent of the firms in the nationally representative survey and a strongly man-dominated sector as a sector in which men manage more than 75 percent of firms. Figure 4.3 shows the distribution of woman- and man-led firms that operate in man- and strongly man-dominated sectors.

FIGURE 4.3. WOMAN-LED FIRMS IN MAN- AND STRONGLY MAN-DOMINATED SECTORS

	Non male-dominated	Male-dominated	Total
Male-led	20	658	658
Female-led	10	155	165
Total	30	813	843

	Non strongly male-dominated	Strongly male-dominated	Total
Male-led	157	521	678
Female-led	57	108	165
Total	214	629	843

Source: World Bank calculations based on INADEM administrative data and baseline survey data, applying distribution from ENAFIN.

Note: ENAFIN does not consider primary services, financial services, and insurance as a type of commerce, so seven of the CEO cannot be divided into man- or strongly man-dominated sectors.

**Women CEOs operating in man-dominated fields differ from CEOs in non-man-dominated fields.** Table 4.5, panel a, shows the differences between women CEOs in man-dominated sectors and women CEOs in non-man-dominated sectors using the full sample of applicants. Estimates indicate women CEOs in man-dominated sectors are younger and have slightly fewer years of education, but they are more likely to hold a science-related degree, compared with the CEOs in non-man-dominated sectors (16 percent versus 0 percent, respectively). Moreover, the CEOs in man-dominated sectors are more likely to have obtained a loan in the year prior to the survey and appear to have invested more during the year. Also, women CEOs operating in man-dominated sectors are more likely to have a website and less likely to be employed in a family-owned firm operating in non-man-dominated sectors.

Findings on the differences between firms operating in strongly man-dominated and non-strongly man-dominated sectors highlight distinctions in other areas not captured by the less stringent classification of sectors (table 4.5, panel b). Women CEOs in strongly man-dominated sectors have fewer years of professional experience, but they are more

likely to report that, if needed, the firm would be able to obtain financial resources from formal entities, unlike many of their counterparts in non-strongly man-dominated sectors. Consistent with previous evidence on women crossovers in Mexico (see Cucagna, Iacovone, and Rubiano-Matulevich 2020), firms operating in strongly man-dominated sectors also achieve higher revenues and profits. In terms of innovation, woman-led firms in non-strongly man-dominated sectors are more likely to have developed or introduced new marketing strategies.





**TABLE 4.5. WOMAN-LED FIRMS, BY SECTOR OF OPERATION (FULL SAMPLE)**

**A. Firms operating in man-dominated sectors**

		1		2	T-TEST
VARIABLES	N	FEMALE CEO IN NON-MALE DOMINATED SECTOR MEAN/SE	N	FEMALE CEO IN MALE DOMINATED SECTOR MEAN/SE	P-VALUE (1) - (2)
CEO Age	10	41.2 (2.890)	155	35.584 (0.627)	0.049**
CEO Education (years)	10	18.1 (0.458)	154	17.26 (0.125)	0.067*
PL reported professional experience (years)	10	14.3 (3.004)	155	6.381 (0.400)	0.007***
IT education field	10	0.1 (0.100)	155	0.071 (0.021)	0.767
Science education field	10	0 (0.000)	155	0.168 (0.030)	0.000***
Administration education field	10	0.7 (0.153)	155	0.465 (0.040)	0.121
Firm-access to 1 mill to finance a project if needed	9	0.889 (0.111)	133	0.947 (0.019)	0.587
Firm-access to 1 mill-formal sources	9	0.333 (0.167)	133	0.647 (0.042)	0.058*
Firm got formal loans in last year	9	0 (0.000)	132	0.167 (0.033)	0.000***
Revenues 2017 (000 MXN)	9	4658.579 (1875.982)	134	7418.657 (1224.574)	0.204
Profits 2017 (000 MXN)	9	572.268 (279.501)	133	961.129 (207.454)	0.251
Firm-Total employment reported-winsor	9	11.778 (2.933)	134	11.09 (1.115)	0.819
Investment 2017 (000 MXN)	9	241.482 (63.386)	134	533.838 (78.418)	0.004***
Value of assets 2017 (000 MXN)	9	767.877 (292.939)	134	1398.319 (263.551)	0.103
R&D (000 MXN)	9	586.333 (349.802)	126	278.548 (51.966)	0.362
Firm developed/introduced new product	9	0.667 (0.167)	134	0.642 (0.042)	0.879
Firm developed/implemented new process	9	0.667 (0.167)	134	0.418 (0.043)	0.131
Firm developed/introduced new marketing strategy	9	0.667 (0.167)	134	0.582 (0.043)	0.607
Firm-Certification in process or granted	9	0.333 (0.167)	134	0.313 (0.040)	0.903
Firm has a website	10	0.9 (0.100)	155	0.69 (0.037)	0.042**
Firm is majority owned by director's family or employee's family	9	0 (0.000)	134	0.082 (0.024)	0.001***

The value displayed for t-tests are p-values. Standard errors are robust. \*\*\*, \*\* and \* indicate significance at the 1, 5, and 10 percent critical level.

B. Firms operating in strongly man-dominated sectors

		1		2	T-TEST
VARIABLES	N	FEMALE CEO IN STRONGLY NON-MALE DOMINATED SECTOR MEAN/SE	N	FEMALE CEO IN STRONGLY MALE DOMINATED SECTOR MEAN/SE	P-VALUE (1) - (2)
CEO Age	57	36.000 (1.099)	108	35.884 (0.754)	0.931
CEO Education (years)	57	17.421 (0.200)	107	17.252 (0.152)	0.503
PL reported professional experience (years)	57	8.175 (0.958)	108	6.167 (0.431)	0.057*
IT education field	57	0.070 (0.034)	108	0.074 (0.025)	0.927
Science education field	57	0.123 (0.044)	108	0.176 (0.037)	0.354
Administration education field	57	0.474 (0.067)	108	0.481 (0.048)	0.925
Firm-access to 1 mill to finance a project if needed	48	0.896 (0.045)	94	0.968 (0.018)	0.135
Firm-access to 1 mill-formal sources	48	0.500 (0.073)	94	0.691 (0.048)	0.030**
Firm got formal loans in last year	48	0.125 (0.048)	93	0.172 (0.039)	0.451
Revenues 2017 (000 MXN)	49	4940.702 (1072.311)	94	8446.094 (1654.944)	0.078*
Profits 2017 (000 MXN)	48	504.050 (178.716)	94	1157.300 (278.252)	0.050*
Firm-Total employment reported-winsor	49	10.265 (1.313)	94	11.585 (1.461)	0.503
Investment 2017 (000 MXN)	49	379.723 (73.804)	94	586.183 (105.022)	0.110
Value of assets 2017 (000 MXN)	49	1160.107 (392.679)	94	1462.132 (317.603)	0.550
R&D (000 MXN)	45	248.736 (84.444)	90	324.233 (68.739)	0.489
Firm developed/introduced new product	49	0.653 (0.069)	94	0.638 (0.050)	0.862
Firm developed/implemented new process	49	0.469 (0.072)	94	0.415 (0.051)	0.538
Firm developed/introduced new marketing strategy	49	0.816 (0.056)	94	0.468 (0.052)	0.000***
Firm-Certification in process or granted	49	0.265 (0.064)	94	0.340 (0.049)	0.351
Firm has a website	57	0.702 (0.061)	108	0.704 (0.044)	0.979
Firm is majority owned by director's family or employee's family	49	0.041 (0.029)	94	0.096 (0.031)	0.191

The value displayed for t-tests are p-values. Standard errors are robust. \*\*\*, \*\* and \* indicate significance at the 1, 5, and 10 percent critical level.

Source: World Bank calculations based on INADEM administrative data and baseline survey data

**Most woman-led firms eligible for the HIEP operate in man-dominated sectors. Hence, the following analysis is purely descriptive.** Estimates in table 4.6, panel a, show that, among eligible firms, women CEOs operating in man-dominated sectors are younger and have slightly fewer years of education compared with the few CEOs leading firms in non-man-dominated sectors. Similarly, they are more likely to hold a science degree (21 versus 0), but less likely to have business-related degrees. Few of them have degrees related to information technology. In the hypothetical situation that the firms were all applying

for loans, all CEOs operating in non-man-dominated sectors are more likely to think that they would obtain the loans, despite the fact that none of them actually obtained (or possibly did not apply for) loans during the year prior to the survey. In contrast, 23 percent of women CEOs in man-dominated sectors had obtained loans in the previous year. Consistent with the findings on the full sample, woman-led firms in non-man-dominated sectors are more likely to have developed or introduced marketing strategies and established websites.





**TABLE 4.6. WOMAN-LED FIRMS, BY SECTOR OF OPERATION (ELIGIBLE FIRMS)**

**A. Firms operating in man-dominated sectors**

		1		2		T-TEST
VARIABLES	N	FEMALE CEO IN NON-MALE DOMINATED SECTOR MEAN/SE	N	FEMALE CEO IN MALE DOMINATED SECTOR MEAN/SE	P-VALUE (1) - (2)	
CEO Age	3	42.167 (3.333)	46	36.413 (1.134)	0.062*	
CEO Education (years)	3	19.000 (0.000)	46	17.413 (0.252)	0.000***	
PL reported professional experience (years)	3	8.333 (2.404)	46	5.652 (0.468)	0.199	
IT education field	3	0.000 (0.000)	46	0.043 (0.030)	0.163	
Science education field	3	0.000 (0.000)	46	0.217 (0.061)	0.001***	
Administration education field	3	1.000 (0.000)	46	0.457 (0.074)	0.000***	
Firm-access to 1 mill to finance a project if needed	3	1.000 (0.000)	43	0.930 (0.039)	0.086*	
Firm-access to 1 mill-formal sources	3	0.333 (0.333)	43	0.651 (0.074)	0.276	
Firm got formal loans in last year	3	0.000 (0.000)	43	0.233 (0.065)	0.001***	
Revenues 2017 (000 MXN)	3	4911.925 (2278.100)	44	8731.110 (2320.476)	0.212	
Profits 2017 (000 MXN)	3	1449.464 (486.032)	43	732.842 (392.817)	0.213	
Firm-Total employment reported-winsor	3	8.000 (3.512)	44	13.568 (2.098)	0.131	
Investment 2017 (000 MXN)	3	204.045 (82.530)	44	467.503 (140.910)	0.103	
Value of assets 2017 (000 MXN)	3	1663.499 (624.821)	44	1076.054 (428.672)	0.391	
R&D (000 MXN)	3	150.000 (125.831)	40	310.534 (112.521)	0.306	
Firm developed/introduced new product	3	0.333 (0.333)	44	0.659 (0.072)	0.263	
Firm developed/implemented new process	3	0.667 (0.333)	44	0.523 (0.076)	0.620	
Firm developed/introduced new marketing strategy	3	1.000 (0.000)	44	0.705 (0.070)	0.000***	
Firm-Certification in process or granted	3	0.667 (0.333)	44	0.318 (0.071)	0.231	
Firm has a website	3	1.000 (0.000)	46	0.870 (0.050)	0.013**	
Firm is majority owned by director's family or employee's family	3	0.000 (0.000)	44	0.068 (0.038)	0.086*	

The value displayed for t-tests are p-values. Standard errors are robust. \*\*\*, \*\* and \* indicate significance at the 1, 5, and 10 percent critical level.

Source: World Bank calculations based on INADEM administrative data and baseline survey data

B. Firms operating in strongly man-dominated sectors

		1		2	T-TEST
VARIABLES	N	FEMALE CEO IN NON-MALE DOMINATED SECTOR MEAN/SE	N	FEMALE CEO IN MALE DOMINATED SECTOR MEAN/SE	P-VALUE (1) - (2)
CEO Age	19	37.526 (1.596)	30	36.283 (1.490)	0.571
CEO Education (years)	19	18.053 (0.329)	30	17.167 (0.325)	0.061*
PL reported professional experience (years)	19	6.053 (0.735)	30	5.667 (0.607)	0.687
IT education field	19	0.053 (0.053)	30	0.033 (0.033)	0.757
Science education field	19	0.158 (0.086)	30	0.233 (0.079)	0.520
Administration education field	19	0.421 (0.116)	30	0.533 (0.093)	0.453
Firm-access to 1 mill to finance a project if needed	17	0.941 (0.059)	29	0.931 (0.048)	0.894
Firm-access to 1 mill-formal sources	17	0.588 (0.123)	29	0.655 (0.090)	0.661
Firm got formal loans in last year	17	0.118 (0.081)	29	0.276 (0.084)	0.182
Revenues 2017 (000 MXN)	18	7326.359 (2327.961)	29	9207.936 (3247.228)	0.640
Profits 2017 (000 MXN)	18	572.932 (356.345)	29	906.229 (560.079)	0.618
Firm-Total employment reported-winsor	18	10.167 (1.706)	29	15.103 (3.004)	0.161
Investment 2017 (000 MXN)	18	170.846 (44.025)	29	624.381 (207.391)	0.039**
Value of assets 2017 (000 MXN)	18	531.230 (193.753)	29	1474.990 (637.116)	0.165
R&D (000 MXN)	16	104.500 (28.984)	27	414.791 (163.426)	0.070*
Firm developed/introduced new product	18	0.500 (0.121)	29	0.724 (0.084)	0.135
Firm developed/implemented new process	18	0.389 (0.118)	29	0.621 (0.092)	0.127
Firm developed/introduced new marketing strategy	18	0.889 (0.076)	29	0.621 (0.092)	0.029**
Firm-Certification in process or granted	18	0.333 (0.114)	29	0.345 (0.090)	0.937
Firm has a website	19	0.737 (0.104)	30	0.967 (0.033)	0.039**
Firm is majority owned by director's family or employee's family	18	0.056 (0.056)	29	0.069 (0.048)	0.855

The value displayed for t-tests are p-values. Standard errors are robust. \*\*\*, \*\* and \* indicate significance at the 1, 5, and 10 percent critical level.

Source: World Bank calculations based on INADEM administrative data and baseline survey data

**Women CEOs operating in strongly man-dominated sectors and the firms they operate are systematically different from the corresponding CEOs and firms in non-strongly man-dominated sectors.** Comparing woman-led firms using the definition of strongly and non-strongly man-dominated sectors (table 4.6), the analysis indicates that women CEOs operating in the former have slightly fewer years of education, but that their firms achieve considerably higher profits. The value of their investments in research and development is almost four times higher than that of woman-led firms in non-strongly man-dominated sectors. Unlike the results in previous sections, woman-led firms are more likely to have a website if they operate in strongly man-dominated sectors, but they are still less likely to develop or introduce new marketing strategies, compared with woman-led firms in non-strongly man-dominated sectors.

**A more detailed analysis of the profits, revenues, and investment value of woman-led firms shows marked differences in a few indicators according to the sector of operation.** Table 4.7, panel a, shows that, on average, firms operating in man-dominated sectors have a larger value in investments compared with their counterparts in non-man-dominated sectors. The differences are not statistically meaningful among any of the other indicators. In contrast, panel b shows that, in strongly man-dominated industries, woman-led firms have higher revenues and profits compared with firms in non-strongly man-dominated sectors. In terms of innovation, the differences based on the sector of operation are not apparent. Estimates in table 4.8, panel a, confirm that firms in man-dominated sectors are less likely to have websites, whereas it is also less likely that women develop or introduce a marketing strategy in strongly man-dominated sectors (panel b).

**TABLE 4.7. PERFORMANCE INDICATORS, WOMAN-LED FIRMS**

**A. Man-dominated industries**

**Performance variables in male dominated industries - only female CEOs**

	<b>1</b> REVENUES 2017 (000 MXN)	<b>2</b> REVENUES 2017 (HYPERBOLIC)	<b>3</b> PROFITS 2017 (000 MXN)	<b>4</b> PROFITS 2017 (HYPERBOLIC)	<b>5</b> FIRM-TOTAL EMPLOYMENT REPORTED- WINSOR	<b>6</b> INVESTMENT 2017 (000 MXN)	<b>7</b> VALUE OF ASSETS 2017 (000 MXN)
Male dominated industries	2760.1 (2163.8)	0.597 (1.115)	388.9 (337.3)	0.0714 (1.905)	-0.688 (3.001)	292.4*** (99.06)	630.4 (383.8)
Constant	4658.6*** (1781.2)	7.227*** (1.087)	572.3** (265.4)	3.423** (1.833)	11.78*** (2.785)	241.5*** (60.18)	767.9*** (278.1)
N	143	143	142	142	143	143	143
Mean	7244.9	7.787	936.5	3.489	11.13	515.4	1358.6

Standard errors in parentheses. Male dominated industry is 1 if the industry has more than 50% male CEOs. Revenues profits employment investment total-investment-value and R&D are winsorized 5%. Profits revenues investment and total value of assets are in thousand MXN pesos. =\*\*\* p<0.10 \*\* p<0.05 \*\*\* p<0.01. bles in strongly male dominated industrys - only female CEOs

**B. Strongly man-dominated industries**

**Performance variables in male dominated industries - only female CEOs**

	<b>1</b> REVENUES 2017 (000 MXN)	<b>2</b> REVENUES 2017 (HYPERBOLIC)	<b>3</b> PROFITS 2017 (000 MXN)	<b>4</b> PROFITS 2017 (HYPERBOLIC)	<b>5</b> FIRM-TOTAL EMPLOYMENT REPORTED- WINSOR	<b>6</b> INVESTMENT 2017 (000 MXN)	<b>7</b> VALUE OF ASSETS 2017 (000 MXN)
Strongly male dominated industries	3505.4* (1972.4)	1.041* (0.547)	653.2* (330.8)	1.366 (1.067)	1.320 (1.963)	206.5 (128.4)	302.0 (504.4)
Constant	4940.7*** (1068.8)	7.103*** (0.476)	504.0*** (178.1)	2.585*** (0.880)	10.27*** (1.309)	379.7*** (73.56)	1160.1*** (391.4)
N	143	143	142	142	143	143	143
Mean	7244.9	7.787	936.5	3.489	11.13	515.4	1358.6

Standard errors in parentheses. Strongly male dominated industry is 1 if the industry has more than 75% male CEOs. Revenues profits employment investment total-investment-value and R&D are winsorized 5%. Profits revenues investment and total value of assets are in thousand MXN pesos. =\*\*\* p<0.10 \*\* p<0.05 \*\*\* p<0.01.



**TABLE 4.8. INNOVATION INDICATORS, WOMAN-LED FIRMS**

**A. Man-dominated industries**

**Innovation variables in male dominated industries - only female CEOs**

	<b>1</b> R&D (000 MXN)	<b>2</b> FIRM DEVELOPED/ INTRODUCED NEW PRODUCT	<b>3</b> FIRM DEVELOPED/ IMPLEMENTED NEW PROCESS	<b>4</b> FIRM DEVELOPED /INTRODUCED MARKETING STRATEGY	<b>5</b> FIRM CERTIFICATION IN PROCESS OR GRANTED	<b>6</b> FIRM HAS WEBSITE
Male dominated industries	-307.8 (336.3)	-0.0249 (0.164)	-0.249 (0.164)	-0.0846 (0.164)	-0.0199 (0.163)	-0.210** (0.103)
Constant	586.3* (332.3)	0.667*** (0.158)	0.667*** (0.158)	0.667*** (0.158)	0.333** (0.158)	0.900*** (0.0954)
N	135	143	143	143	143	165
Mean	299.1	0.643	0.434	0.587	0.315	0.703

Standard errors in parentheses. Male dominated industry is 1 if the industry has more than 50% male CEOs. Revenues profits employment investment total-investment-value and R&D are winsorized 5%. Profits revenues investment and total value of assets are in thousand MXN pesos. =\*\*\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

**B. Strongly man-dominated industries**

**Innovation variables in strongly male dominated industries - only female CEOs**

	<b>1</b> R&D (000 MXN)	<b>2</b> FIRM DEVELOPED/ INTRODUCED NEW PRODUCT	<b>3</b> FIRM DEVELOPED/ IMPLEMENTED NEW PROCESS	<b>4</b> FIRM DEVELOPED /INTRODUCED MARKETING STRATEGY	<b>5</b> FIRM CERTIFICATION IN PROCESS OR GRANTED	<b>6</b> FIRM HAS WEBSITE
Strongly male dominated industries	75.50 (108.7)	-0.0148 (0.0847)	-0.0545 (0.0882)	-0.348*** (0.0761)	0.0751 (0.0804)	0.00195 (0.0753)
Constant	248.7*** (84.13)	0.653*** (0.0685)	0.469*** (0.0718)	0.816*** (0.0557)	0.265*** (0.0635)	0.702*** (0.0610)
N	135	143	143	143	143	165
Mean	299.1	0.643	0.434	0.587	0.315	0.703

Standard errors in parentheses. Strongly male dominated industry is 1 if the industry has more than 75% male CEOs. Revenues profits employment investment total-investment-value and R&D are winsorized 5%. Profits revenues investment and total value of assets are in thousand MXN pesos. =\*\*\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

Source: World Bank calculations based on INADEM administrative data and baseline survey data



## CONCLUSIONS

**A large body of evidence suggests that women, compared with men, tend to own, and manage smaller and less profitable firms.** They are also more likely to operate in less capital-intensive sectors, which often have less potential for high growth. Overall, evidence on the factors that allow women to grow their businesses is key to reducing gender gaps in economic opportunities and fostering high-impact entrepreneurship.

**This chapter examines differences between the characteristics and performance of woman- and man-led SMEs with high economic growth potential in Mexico.** It employs administrative records and baseline survey data from a randomized controlled trial (chapter 1) to evaluate the impact of a matching-grant scheme to support innovative SMEs. The analysis was conducted for two groups of firms: (1) the pool of applicants in the program and (2) firms eligible for the program.

**The results show no evidence of systematic differences between key characteristics of women and men CEOs, including age, years of education, and educational background.** Most CEOs have business-related degrees, and only a small share holds degrees in sciences or fields related to information technology. Small differences are found only in two areas. First, women CEOs have slightly fewer years of education, and, second, woman-led firms are less likely than man-led firms to have obtained loans in the year prior to the survey.

**Woman-led firms have lower sales revenue than firms with man CEOs: they have fewer employees and they exhibit lower levels of investment and assets, even after controlling for sector of operation.** In terms of innovation, firms with women CEOs spend nearly 50 percent less than firms with men CEOs in research and development, but there are no differences in the introduction of new or significantly improved products, processes, or marketing strategies. This is also the case of management or business practices, in which gender differences are not significant.

**Sectors in which woman-led firms operate appear to drive some of these differences.** Women CEOs operating in man-dominated sectors are younger and have slightly fewer years of education, but they are more likely to hold science-related degrees compared with CEOs in non-man-dominated sectors. They are more likely to have obtained loans in the year prior to the survey and appear to have invested more during the year. Also, women CEOs operating in man-dominated sectors are more likely to have websites and less likely to be employed in family-owned firms operating in non-man-dominated sectors. Consistent with previous evidence on women crossovers in Mexico (see Cucagna, Iacovone, and Rubiano-Matulevich 2020), firms operating in strongly man-dominated sectors also enjoy higher revenues and profits.

**It is important to note, however, that woman-led firms represent a small share of the sample in this study,** which may be an indication that women are significantly less likely to apply for high-impact programs. Further research would be useful on this issue; however, here are some policy recommendations based on the findings of this study:

- **Addressing the challenges on both the supply- and demand-side of the financial market.** Access to finance is a common barrier among woman-led businesses. There is a need to provide tailored financial support for women entrepreneurs with potential for high growth, including venture capital investment. Angel investment is another form of early-stage investment, but it is typically more informal and may easily translate into debt or ownership equity. Public procurement opportunities are another promising approach.
- **Creating networks of entrepreneurs to access resources, customers, business partners, and financing.** **Women entrepreneurs tend to have smaller and more** informal networks than their man counterparts. It is thus important for policy makers to increase the pool of resources available to woman-led businesses by expanding women's business networks and using online interfaces to connect entrepreneurs. This can be accomplished in combination with other policy interventions, including training and business support services.
- **Encouraging women to enter nontraditional sectors.** **Growing evidence shows that women benefit from crossing over into traditional man occupations.** The many impediments to women entering nontraditional occupations include lack of information about opportunities in man-dominated industries and market returns. Traditional gender roles can also hinder women from entering these sectors.
- **Providing information about higher-return opportunities can encourage women to enter man-dominated sectors.** This type of feature can be integrated in training programs and as part of the financial products offered to women entrepreneurs.





# APPENDIX: DETAILS ON TRAINING CONTENT

## A. HARD SKILLS TRAINING

The methodology for the hard skills set of modules has been developed by CREA and is divided into seven main modules: (1) cost calculation, (2) prices determination, (3) legal considerations, (4) organization and production strategies, (5) marketing strategies, (6) sales strategies, and (7) the creation of a business plan. Each session of the training program is presented by personnel who have been trained and prepared to cover the content of the session properly, to encourage participation, and to address any doubts about the content.

The trainers have a professional and academic background in business administration, finance, or the social sciences and are required to have at least two years of professional experience working with women microentrepreneurs and entrepreneurs. They are also required to have experience in education. They are trained through a 40-hour course that includes role-play exercises and mock sessions, and this is reinforced each semester through a 24-hour additional training course. They are supervised at least three times every quarter, and the information gathered through the supervision is constantly reviewed by the methodology unit within CREA.

For each of the seven hard skills modules, a printed manual with concepts and definitions, real life examples, and in-class and takeaway exercises is provided to each entrepreneur. The contents covered are the following:

**1. How to calculate costs.** The general objective is to provide guidance on how to maximize profits by calculating the expenditure needed to produce or sell. It includes the following topics: learning the importance of money and administration; understanding what costs are; understanding fixed versus variable costs and unitary costs; understanding production costs; understanding how to calculate profits.

**2. How to calculate prices.** This module covers adding value, organizational structures, processes mapping investment decisions, and how to reduce costs.

**3. Legal considerations.** This covers how to comply with legal and fiscal requirements and describes the processes that need to be implemented to register a business. While participants are shown the benefits of registering their business, such as access to the federal and local business support opportunities this affords, they are not required to register to continue in the program.

**4. Organization and production strategies.** This covers the various ways to organize a business and to obtain the tools necessary to establish an efficient production process. It introduces marketing notions and ways to brand a business.

**5. Marketing strategies.** This addresses how to design a marketing strategy, including practical exercises, understanding the implications of promotion, prices and placing for their sales, as well as designing and thinking on how to define their brands.

**6. Sales strategies.** Covers how to develop skills to interact and to create customer relationships to increase sales.

**7. Business plan.** Accompanies them through an in-depth analysis of their enterprise to make a projection of goals and specific objectives for the following years.

## B. Soft skills training: personal Initiative

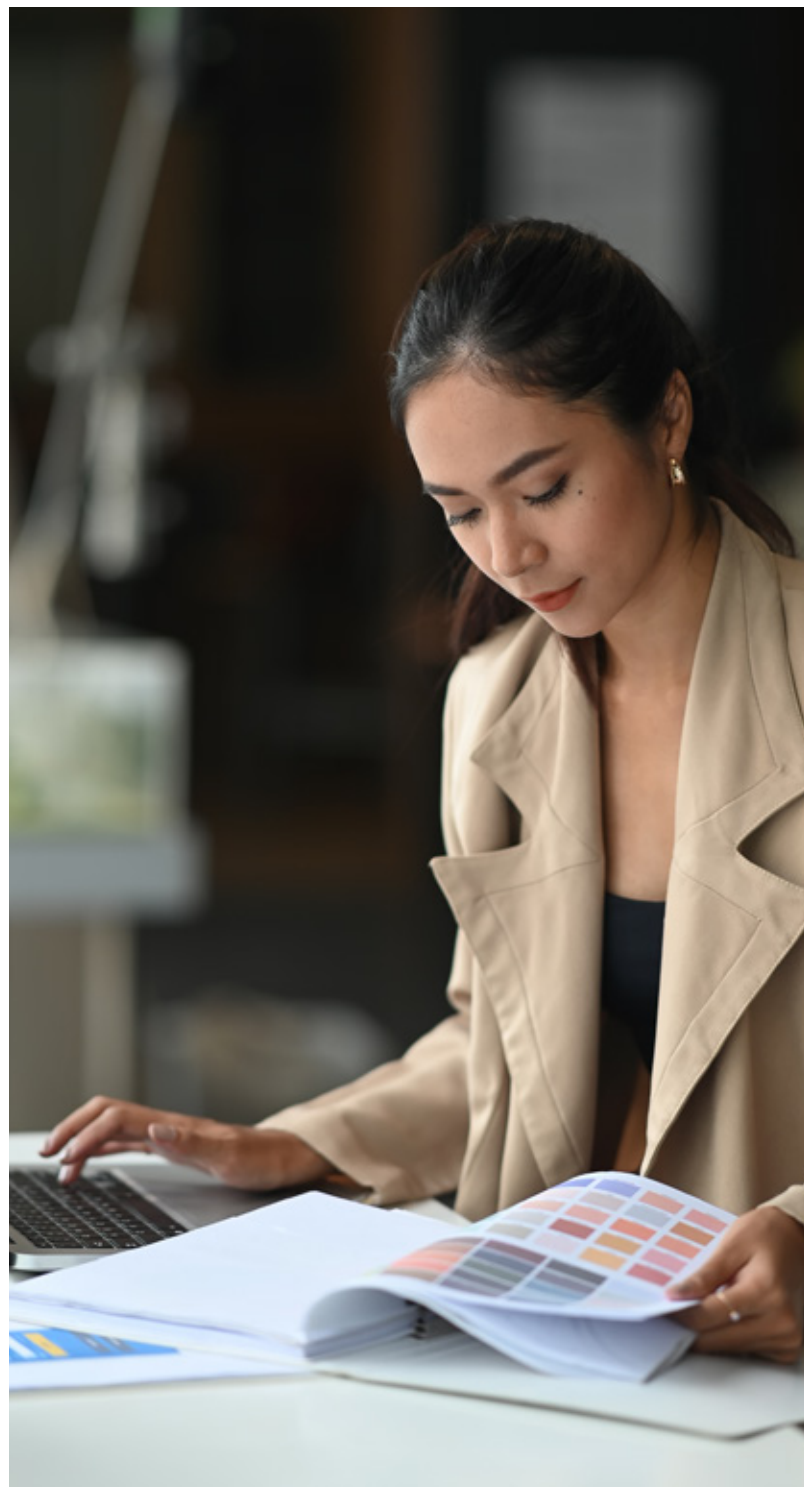
The methodology for the personal initiative training was developed by researchers at Leuphana University of Lüneburg, Germany—the Frese Research Group, directed by Professor Michael Frese—and is based on the psychological literature on personal initiative and action theory. The objective of this part of the training is to motivate the entrepreneurs to adopt a personal initiative behavior characterized by three components: (1) it is self-starting; (2) it is a future-oriented vision; and (3) it is persistent.

Acting in a self-starting way means that individuals start actions themselves without waiting for instructions from outside or by simply reacting to personal role requirements resulting from various work roles (Frese and Fay 2001). Future-oriented behavior involves the consideration of and preparation for possible future setbacks and opportunities (Frese and Fay 2001). Showing persistence means that the individual confronted with a problem does not give up because of internal or outside barriers. Internal barriers are barriers inside the individual, for example, frustration or lack of motivation to continue. Outside barriers are caused by the environment, for example, a shortage of money or the lack of access to important information.

Entrepreneurs are encouraged to carry out changes to improve their business, prevent negative externalities from unexpected events, and to get ahead of their competition, and this is to be accomplished through analysis and internalization of the principles of personal initiative.

The trainers have the same prerequisites as a hard skills trainer, but they need to have an additional certification issued by CREA, which they may obtain after completing a 58-hour personal initiative training course in which no more than 14 trainers participate simultaneously. The first day of this course consists of an introduction to the methodology, the outline of the modules, and practical examples that could improve the learning process. The following 32 hours include a demonstration training process, with role-playing, through which the trainers prepare and present each topic and obtain feedback from the master-trainers. The last 18 hours are divided into three six-hour sessions in which a pilot training component is provided to a group of entrepreneurs and after which additional feedback is supplied to the entrepreneurs. After the pilot process, satisfaction questionnaires are completed by the entrepreneurs as well as an exercise during which they describe relevant improvements they might carry out in their business. Each quarter, trainers must take an additional 16-hour training course to reinforce their understanding, and they are supervised at least once each quarter. All master-trainers have been certified by Leuphana University of Lüneburg.

The personal initiative section of the course was first undertaken after the seven hard skills sequence to complement the management tools the women had learned. However, it was noted that these sessions gave women confidence and hooked them on the program in a positive way. To prevent dropouts, the order of the sessions was switched, and personal initiative now precedes the hard skills component.









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