

Persistent Gender Gaps in Business Profits in Indonesia: Implications for COVID-19 Recovery Policies

Mayra Buvinic, James C. Knowles, and Firman Witoelar

Abstract

This paper analyzes a rich pre-pandemic data set on both men and women business owners from 401 mainly rural villages in five regencies (kabupaten) of East Java province, Indonesia. There are some similarities but mostly large gender differences in characteristics and resources in this random sample of Indonesian businesswomen and businessmen. Similarities include years worked in the business and cognitive ability of businesspeople. Large differences include proportionately more women business owners operating ‘consumer facing’ restaurants and retail shops hard hit by the Covid-19 pandemic and sharp gender gaps favoring men in the total value of business capital and savings and in all sources of monthly earned income. Multivariate analysis (propensity score matching) finds that much of the observed gender gaps in earned income and savings remain after business owners are effectively matched on the basis of their pre-existing characteristics and resources (endowments) suggesting that underlying discrimination may be an important driver. The findings further suggest that discrimination by customers and gender rigidities in women’s work time allocation likely contribute to gender inequalities in business outcomes. In the absence of effective interventions, there is a risk of a vicious cycle in which women’s low earnings lead to low savings (unexplained by gender differences in saving behavior), limited capital formation and risk-taking, and to even lower earnings. The paper uses these and other findings to discuss ways for gender-informed economic recovery programs to strengthen micro and small businesses, especially by addressing household and community factors that tilt business environments in favor of men.

Keywords: gender, women’s entrepreneurship, women’s business outcomes, financial inclusion

JEL codes: J16, L26, B54, D91

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Contents

1. Introduction.....	1
2. Data.....	2
3. Methods.....	3
4. Gender differentials in business owners' predetermined characteristics and resources	7
5. Gender gaps in business outcomes	8
5.1. Earned income.....	8
5.2. Savings	10
5.3. Other business outcomes.....	11
6. Discussion.....	13
References	16
Tables	17
Annex. Description of the data	20

List of figures

Figure 1. Estimated propensity scores by sex prior to matching values of total earned income (Rp. millions)	5
Figure 2. Estimated propensity scores by sex after matching values of total earned income (Rp. millions)	6
Figure 3. Natural log of the value of total business assets (Rp. millions) by sex prior to matching.....	6
Figure 4. Natural log of the value of total business assets (Rp. millions) by sex after matching	7
Figure 5. Percentage distribution of business owners by type of primary business (N = 4,825).....	8
Figure 6. Business owners' average monthly earned income (Rp. millions) during the last 12 months by main source and sex (N = 4,802).....	9
Figure 7. Observed and matched estimates of proportional gender gaps in average monthly earned income (Rp. millions) by source	9
Figure 8. Savings over a 12-month period: total and as % of reported income by sex	10
Figure 9. Observed and matched estimates of proportional gender gaps in savings	11
Figure 10. Observed and matched estimates of proportional gender gaps in numbers of customers, workers and own labor inputs in primary businesses	12
Figure 11. Observed and matched estimates of proportional gender gaps in business practices, access to credit and agency	12

List of tables

Table 1. Results for earned income by source.....	17
Table 2. Results for personal savings of business owners.....	18
Table 3. Results for other business outcomes.....	19
Table A-1. Sample means, standard deviations and sample size by sex of business owners' outcomes	22
Table A-2. Means, standard deviations and sample size by sex of business owners' predetermined characteristics and resources.....	24
Table A-3. Simulation of the effects on the profitability of women-owned businesses of changing business types versus changing business profitability.....	25

1. Introduction

Women-owned businesses around the world have been hit hard by the Covid-19 pandemic, closing at higher rates than men-owned ones, partly because the demand shock affected sectors where they concentrate, the containment measures exacerbated pre-existing gender differences in time use, and existing gender gaps (such as in digital connectivity) affected their ability to adapt and access pandemic-related support (Facebook, OECD and World Bank, 2020; Koshy and Sanchez, 2021; Iacovone and colleagues, 2021). In response, recovery policies need to be tailored to address businesswomen's needs, to redress rather than intensify gender inequalities in business performance and outcomes. This paper analyzes gender gaps in business outcomes between women and men business owners in pre-pandemic Indonesia, to help shape gender-informed recovery policies. Helping women's firms is especially important for economic recovery policies in Indonesia since businesswomen account for over half of the country's micro, small and medium enterprises and the sector contributes 43% of gross national product (World Bank, 2016).

The analysis uses a random sample of 4,828 women and men business owners in 401 villages in East Java to determine how much of the observed gender gaps in business outcomes favoring men remain after adjusting for gender differences in business owners' predetermined¹ characteristics and resources (endowments). We assume that business owners' observed (measured) characteristics and resources interact with unobserved (unmeasured) individual, household and community level characteristics (e.g., ambition, traditional gender norms, discrimination) to produce business outcomes. Any residual gender gaps that remain after adjusting for differences in business owners' observed characteristics and resources are attributed to the unobserved factors.

Using propensity score matching techniques, the study finds that 40% of gaps in earned income favoring men remain unexplained when women business owners are compared to their men counterparts with similar observed characteristics and resources (e.g., demographic features, education, cognitive ability and risk taking, business experience, business capital and household assets). These residual gender gaps are presumed to be mainly due to traditional gender norms and gender discrimination in the community, intra-household allocation of resources favoring men, and gender differences in unobserved individual characteristics that affect the way business owners operate their firms (e.g., use of paid versus unpaid labor) as well as the number of customers they attract and their access to business capital.

This paper finds that large residual gender gaps favoring men business owners in savings are mainly due to their higher earned incomes. Savings are important for many reasons, including as a partial source of financing capital investment (including both physical and working capital) and for providing a cushion that allows business owners to take on more risk. Over time, the strong linkages between earnings, savings, capitalization and risk taking can produce

¹ They are *predetermined* because they reflect past events (age, marriage, completed schooling) or because they have cumulated over several years (experience, capital assets), as distinct from the outcomes that reflect actions taken within the past 12 months (earnings, savings, labor inputs).

a vicious cycle in which women's lower earnings lead to lower savings, lower capitalization and reduced risk taking, leading to even lower earnings.

Businesswomen operate more 'consumer facing' businesses (restaurants and retail) that have been more affected by the pandemic; the disadvantages women firms experience in terms of fewer customers *increase* when firms are matched on characteristics and resources, suggesting that gender discrimination in the business environment (including by customers) partly accounts for women-owned businesses' worse outcomes. Pre-pandemic, women business owners worked longer hours in their primary businesses and these hours were unaffected by having additional resources. This highlights the likely severe time conflicts these women must have encountered with the pandemic triggered lockdowns and the need to devote significantly more time to unpaid care and household work.

More encouraging, business practices of women are not significantly different from those of men with similar characteristics and resources, suggesting that business practices are not subject to the forces of gender discrimination and other unobserved factors in the same way that other business outcomes are. The report uses these and other findings to discuss possible ways for gender-informed economic recovery programs to strengthen micro and small firms, especially by addressing household and community factors that tilt business environments in favor of men.

The paper first describes the data (section 2) and the methodology (section 3) and then examines gender differentials in the predetermined characteristics and resources available to business owners that are hypothesized to account for at least some of the observed gender gaps in earned incomes, savings and other business outcomes (section 4). Propensity score matching is then used to assess how much of the observed gender gaps in earnings, savings and other key business outcomes remain after business owners are effectively matched on the basis of their observed characteristics and resources (section 5). Section 6 discusses the paper's findings and their possible policy implications.

2. Data

The paper is based on data on 4,828 business owners (2,852 females and 1,976 males) from 401 mainly rural villages in five regencies (*kabupaten*) of East Java province, Indonesia.² These data were collected as baseline data for an impact evaluation of the Mobile Financial Services for Female Business Owners project (Buvinic and colleagues, 2018). The sample villages are rural or semi-rural villages selected by a partner bank as suitable sites for introducing branchless banking services. Village listings of business owners were prepared as the basis for randomly selecting 12 owners of established businesses in each sample village (i.e., 7 females and 5 males). In addition to owning at least one established non-farm business,

² The sample regencies (formerly referred to as districts) include Bojonegoro (73 villages), Ngawi (101 villages), Tuban (72 villages), Lamongan (140 villages) and Gresik (15 villages) (Survey Meter, 2018).

the surveyed business owners were required to reside in the sample villages, be between the ages 18–55 and have a mobile phone with an active account. The data were collected in 2016–2017 in two waves spanning a 13-month period. The interviews were conducted using a computer-assisted personal interview (CAPI) system with pre-programmed consistency and outlier checks and with the interviewers entering information electronically (using a laptop) during the interviews. The data are described in more detail in Annex 1.

3. Methods

To answer questions about gender differences in economic outcomes, outcomes were compared for a sample of women and men business owners who were well matched in terms of their pre-determined characteristics and resources, using the matching technique of propensity score matching (PSM), as discussed below.³ To measure gender differences the study uses the proportional gender gap (PGG) or the difference between the women’s and men’s sample mean values of an outcome ($\text{mean}[Y_w] - \text{mean}[Y_m]$) divided by the men’s mean value ($\text{mean}[Y_m]$):⁴

$$\text{PGG}(Y) = [\text{mean}(Y_w) - \text{mean}(Y_m)] / \text{mean}(Y_m) \quad (1)$$

A negative PGG implies that women business owners are disadvantaged compared to men business owners, whereas a positive PGG implies that men business owners are disadvantaged compared to women.

The matched proportional gender gap (PGG_{ma}) is defined as the difference between the unweighted mean values of Y for women and the weighted mean values for men divided by the unweighted mean values for men:

$$\text{PGG}(Y)_{ma} = [\text{mean}(Y_w) - \text{weighted}(Y_m)] / \text{mean}(Y_m) \quad (2)$$

where “weighted” refers to the weighting of the individual businessmen’s observations according to the similarity of their pre-determined characteristics and resources with those of the sample businesswomen.

In this paper, we are particularly interested in the difference between the matched (ma) and the unmatched (un) PGGs:

$$\text{DIF}(Y) = \text{PGG}(Y)_{ma} - \text{PGG}(Y)_{un} \quad (3)$$

³ Matching has been used to analyze gender gaps in employees’ pay in several other studies (Ñopo 2008, Frölich 2007, Meara and colleagues, 2019).

⁴ This is the metric used by OECD.Stat for measuring gender gaps in the earnings of the self-employed (<https://stats.oecd.org/>), although the sign is reversed so that a positive gender gap favors men.

Positive values of DIF imply that gender gaps after matching are more favorable to women business owners, whereas negative values of DIF imply that gender gaps after matching are more favorable to men business owners.⁵

Unmatched PGGs can be conveniently estimated from the following linear regression model:

$$Y = \alpha + \beta W * \text{mean}(Y_m) + \varepsilon \quad (4)$$

where Y is an outcome (e.g., total earned income), W is a dummy variable indicating a woman business owner, $\text{mean}(Y_m)$ is the unweighted sample mean of Y among men business owners, α and β are fixed parameters and ε is a random disturbance term that is clustered at the village level. The OLS estimate of β (b) yields a consistent estimate of the observed (unmatched) PGG in equation (1). The matched PGGs in equation (2) can be conveniently estimated as b' using the same regression model, using the PSM weights as probability weights. Estimates of DIF are obtained as $b - b'$.⁶

Despite large gender differences in characteristics and resources in the sample, many of which are rooted in gender discrimination, we were able to match women and men business owners effectively to compare their various outcomes in this matched sample. The estimated propensity scores used to identify suitable matches were obtained from a probit regression model in which the dependent variable is a binary variable with values of one indicating women business owners (the “treated” sample) and values of zero indicating men business owners (the “controls”) and a rich set of explanatory variables referring to the predetermined characteristics and resources of the business owners (including their educational level, cognitive ability and risk taking preferences as well as whether business owners have a bank account in their name, the number of years that the owners have worked in the primary business, and the primary business type).⁷

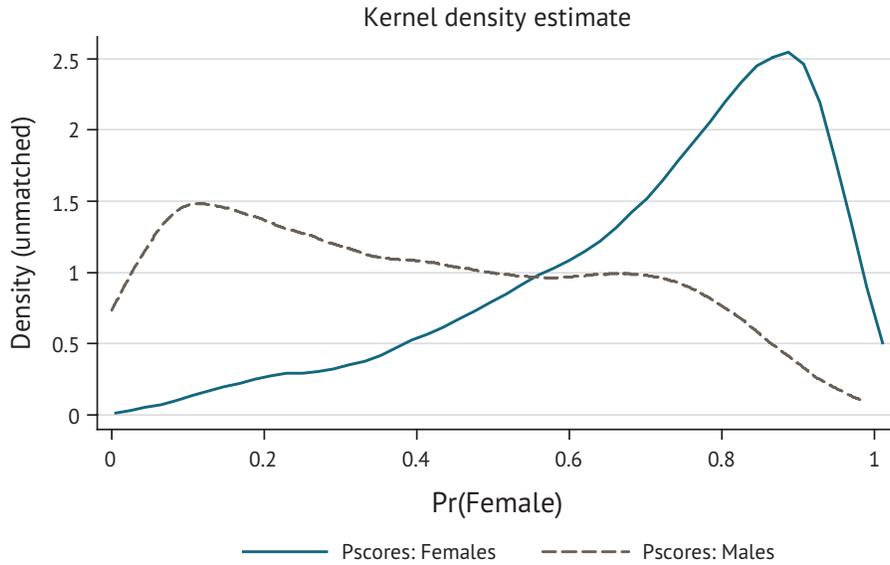
⁵ If $\text{PGG}(Y)_{\text{un}}$ is negative (i.e., the unmatched gender gap favors men), a positive value of DIF implies a reduction in the gender gap favoring men after matching. If $\text{PGG}(Y)_{\text{un}}$ is positive (i.e., the unmatched gender gap favors women), a positive value of DIF implies that the gender gap favoring women has increased after matching.

⁶ Tests of the significance of DIF are obtained by using Stata’s “suest” command with clustering at the village level to combine the observed and matched estimates (b and b') in order to test for the equality of β and β' across the two equations.

⁷ The explanatory variables specified in the probit model include dummy variables referring to age (7 categories), highest level of schooling completed (5 categories), cognitive ability (5 categories), whether currently married (0–1), whether the business owner has any children (0–1), whether the business owner has a bank account in their name (0–1), whether the primary business is registered with the government (0–1), whether the business owner has a second business (0–1), the year in which the primary business was started (4 categories), the number of years that the owner has worked in the primary business (and years working squared), the owner’s willingness to take risk (10 categories), household size (10 categories), household asset quintile (5 categories), business asset quintile (5 categories), primary business type (6 categories), and factorial interactions between currently married (0–1) and age group (7 categories), willingness to take risk (10 categories) and age group (7 categories), and household asset quintile (5 categories) and age group (7 categories). Variables such as district of residence and urban-rural location are not included because sex is uncorrelated with location due to the sample design. After omitting one variable from each group of dummy variables (the omitted category), which is represented by the constant term, there are a total of 141 explanatory variables in the estimated probit model.

We illustrate the matching procedure using total earned income as the outcome. Before matching, the distributions of the estimated propensity scores (pscores) between businesswomen and businessmen are different, as expected, but the two distributions overlap over much of their respective ranges, as shown in Figure 1, i.e., there are some businessmen with the same or similar estimated pscores as most of the businesswomen.⁸

Figure 1. Estimated propensity scores by sex prior to matching values of total earned income (Rp. millions)



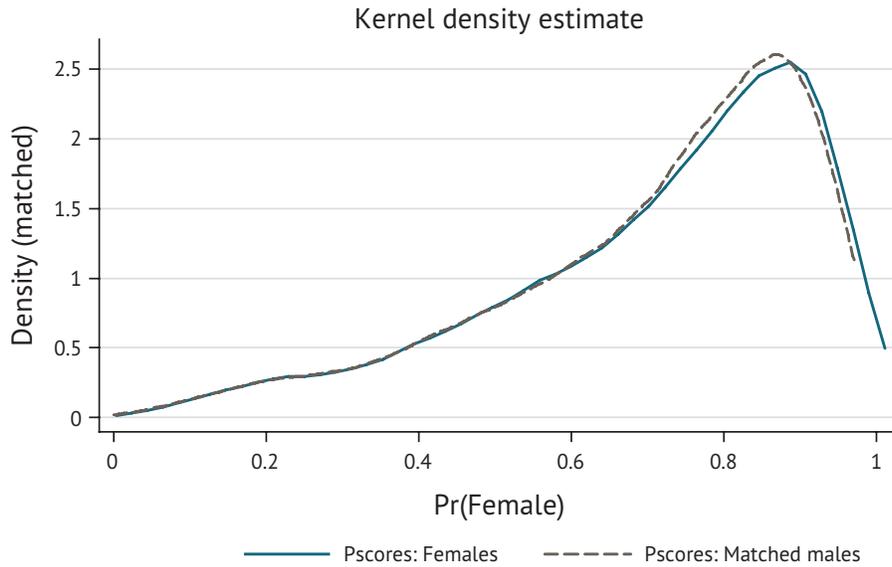
kernel = epanechnikov, bandwidth = 0.0383

After matching, however, the two distributions overlap almost completely (Figure 2), indicating that the matching was successful.⁹

⁸ In this example, 126 businesswomen have very high estimated pscores (0.0973 and above) for which there are no businessmen with estimated pscores in the same range. These 126 women business owners are “off-support” and are dropped from the sample used to obtain the reported matching estimates. Because the number of off-support businesswomen varies depending on the outcome, the matching is done separately for each outcome, leading to small differences in the sample sizes of the DIF estimates reported in Tables 1–3.

⁹ Kernel matching is the matching method used in this paper for all outcomes (using the epanechnikov distribution and a bandwidth of 0.06). With kernel matching, the observations of the individual businessmen receive different weights reflecting the similarity of their pscores to those of sample businesswomen in the same “neighborhood” (as defined by the selected bandwidth).

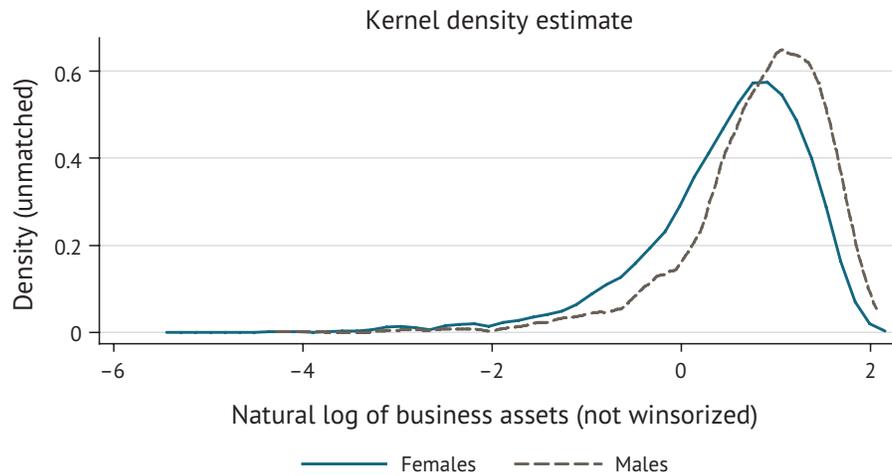
Figure 2. Estimated propensity scores by sex after matching values of total earned income (Rp. millions)



kernel = epanechnikov, bandwidth = 0.0383

Figures 3 and 4 compare the pre- and post-matching distributions of the natural logarithm of the total value of business assets, a highly skewed characteristic with one of the largest pre-matching gender gaps.¹⁰ Figure 3 shows the unmatched and different distributions for women and men business owners, and Figure 4 shows the two similar distributions when the estimated PMS weights are applied to the men's values.

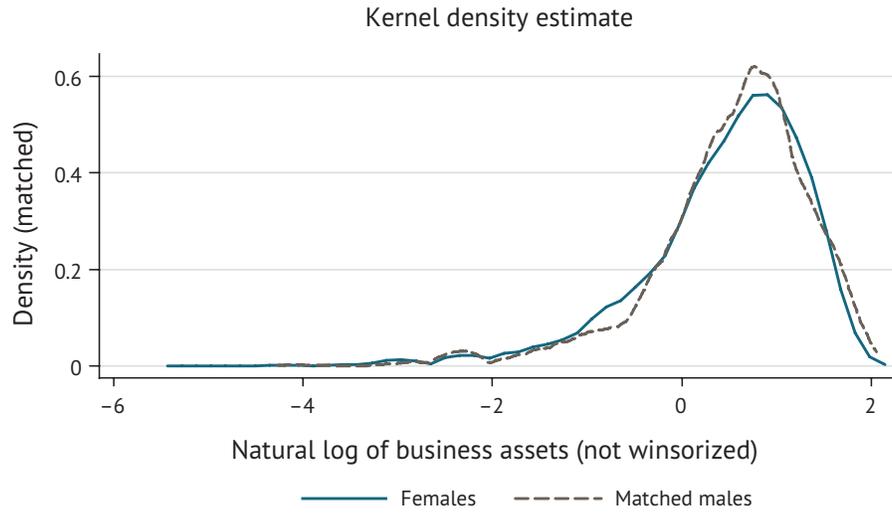
Figure 3. Natural log of the value of total business assets (Rp. millions) by sex prior to matching



kernel = epanechnikov, bandwidth = 0.1404

¹⁰ The total value of business assets in Rp. millions is transformed to a natural log value because it is highly skewed (skewness = 9.09), with only 13 zero values.

Figure 4. Natural log of the value of total business assets (Rp. millions) by sex after matching



The estimates of the observed (pre-matching) PPGs, the matched PPGs, the DIFs and the absolute values of the DIFs as a percentage of observed PPGs are reported in Table 1 (earned income by source), Table 2 (savings by saving instrument) and Table 3 (other business outcomes for primary and second businesses). Because many of the outcomes have large numbers of zero values, the estimates are provided separately for the full samples and for the sample conditional on a positive value.

4. Gender differentials in business owners' predetermined characteristics and resources

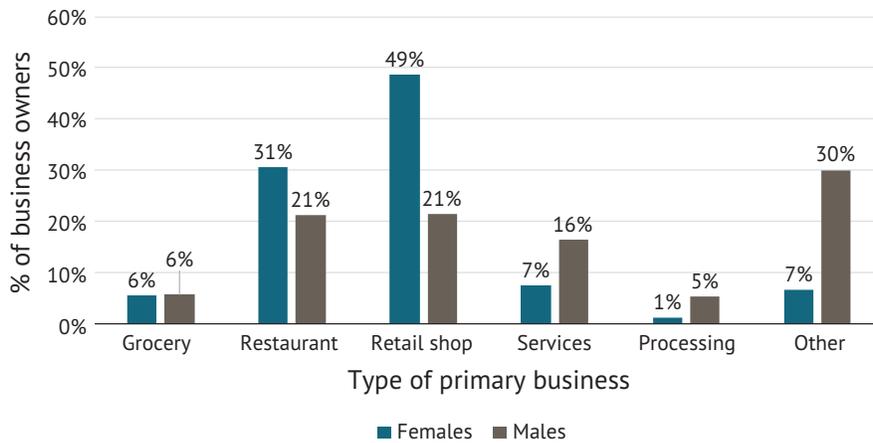
Women business owners tend to be younger than men business owners (an average age of 37.6 years, versus 39.4 among men), but the overall percent married (91%) and average household size (4.32) is almost identical among both women and men (Table A-2). Very few women business owners report that they are heads of household (only 8% versus 86% of men). Men business owners are also more likely to have completed upper secondary schooling (48% of men versus 39% of women). However, despite the sizable gender gap in school attainment, gender differences in cognitive ability scores are small (3.07 on average on a scale of 0–4 among women versus 3.11 among men). Importantly, businesswomen report a lower willingness to take risks (an overall average of 3.99 on a scale of 1–10 compared to 4.80 among men).

Women business owners come from more prosperous households overall, as indicated by a household asset index (i.e., the average asset index value is +0.040 among women, compared to -0.058 among men), suggesting the income advantages of two-income earner families. Despite these women's higher household economic status, they are less likely both to have a bank account in their name (48% versus 61% among men business owners)

or to have a smart phone (37% women versus 45% men) alerting to the likely disadvantage businesswomen face in accessing pandemic-related benefits for their firms.

The largest gender differences in business characteristics occur with respect to the type of business operated and the total value of business capital. Proportionately more women operate ‘consumer facing’ restaurants and retail shops which have been hard hit by the pandemic, while proportionately more men operate other (unspecified) types of businesses as well as service and processing businesses, which have weathered the pandemic lockdowns better (Figure 5). The overall gender gap in the total value of business assets is more than 2:1 favoring men (an average of 60 million Rp. for men versus 21 million for women).

Figure 5. Percentage distribution of business owners by type of primary business (N = 4,825)

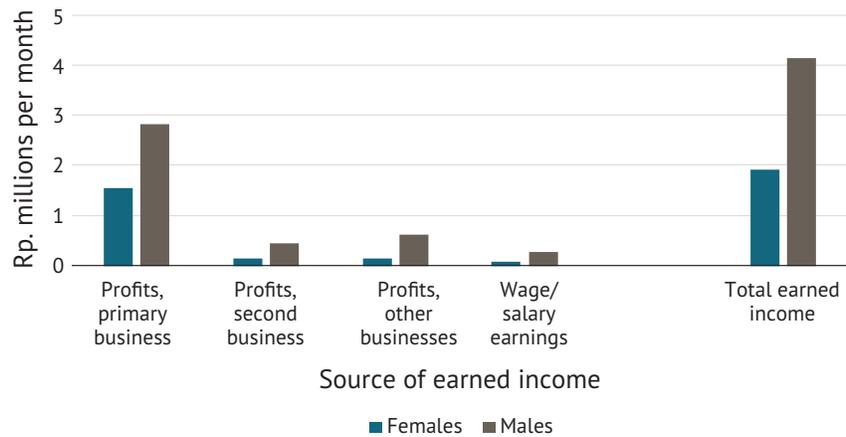


5. Gender gaps in business outcomes

5.1. Earned income

There are sharp gender differences (more than 2:1) favoring men business owners in the total average monthly earned income during the last 12 months as well as in all four of its main sources (profits from a primary, secondary or additional business and wage and salaried earnings). See Table A-1 and Figure 6.

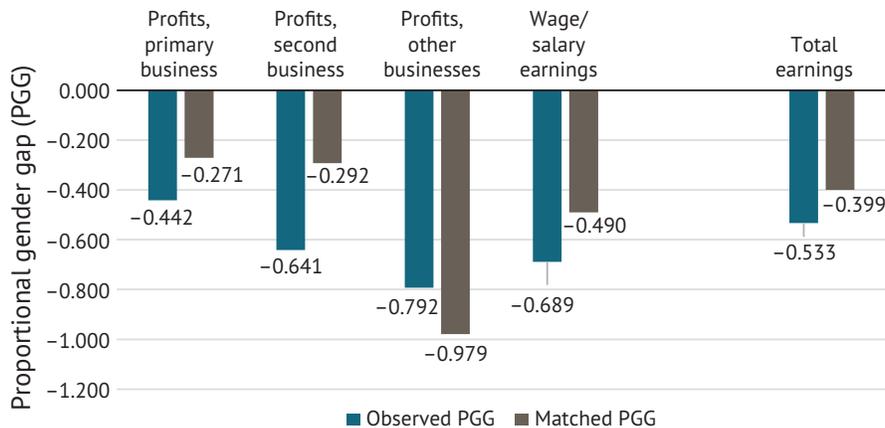
Figure 6. Business owners' average monthly earned income (Rp. millions) during the last 12 months by main source and sex (N = 4,802)



Note: These estimates include zero values when business owners report no income from one or more sources.

Matching on the business owners' characteristics and resources significantly reduces (by 25%) the negative PGG favoring men in total earned income, leaving a residual PGG of -0.399 (Figure 7 and Table 1, column 4). In other words, after adjusting for the additional endowments that men business owners have, the total earned income of women is still 40% lower than that of men. This residual gender gap is assumed to be mainly due to unobserved gender norms and gender discrimination in the household, community, and business environments as well as possibly other unobserved individual characteristics (e.g., ambition, self-confidence). In practical terms, the large residual gender gap in total earned income means that even if effective policies were implemented to equalize the characteristics and resources available to women and men business owners, a large gender gap in all sources of earned income would likely remain because discriminatory contextual and household factors that negatively impact women's business performance and income have not been addressed.

Figure 7. Observed and matched estimates of proportional gender gaps in average monthly earned income (Rp. millions) by source



Source: Table 1.

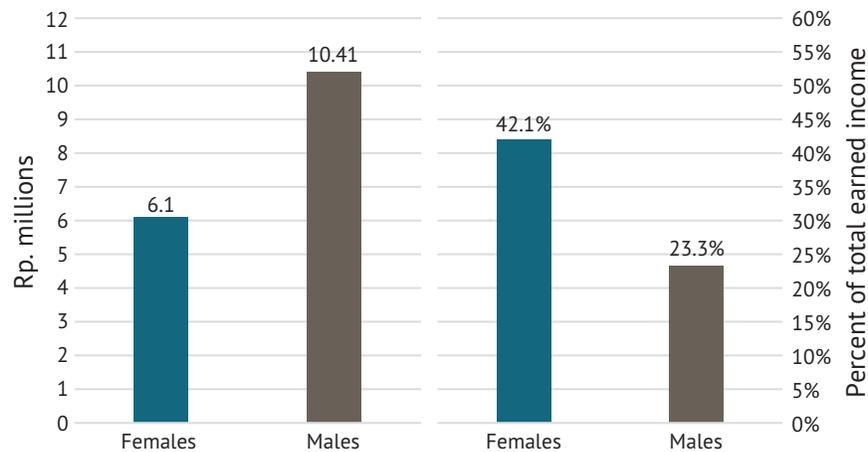
Note: These estimates include zero values when business owners report no income from one or more sources.

5.2. Savings

Men business owners report substantially higher average total savings over a 12-month period in 2016-17—Rp. 10.4 million for men versus Rp. 6.1 million for women. However, more women business owners reported any saving over the period (84% compared to 69% for men) and make a substantially bigger effort to save despite their lower incomes—with 42% of total earned income saved for women compared to 23% for men (Figure 8 and Table A-1).

There are also important gender differences in the way business owners save. Men prefer to save in both formal bank accounts and savings at home (accounting respectively for 53% and 27% of their reported savings in the last 12 months), whereas women spread their savings more equally between bank accounts (32%), at home (24%), rotating savings and credit associations (25%) and informal savings (6%). Forty-two percent of men business owners reported having loans currently with a bank, compared to only 23% of women business owners, indicating men’s easier access to credit (Table A-1).

Figure 8. Savings over a 12-month period: total and as % of reported income by sex

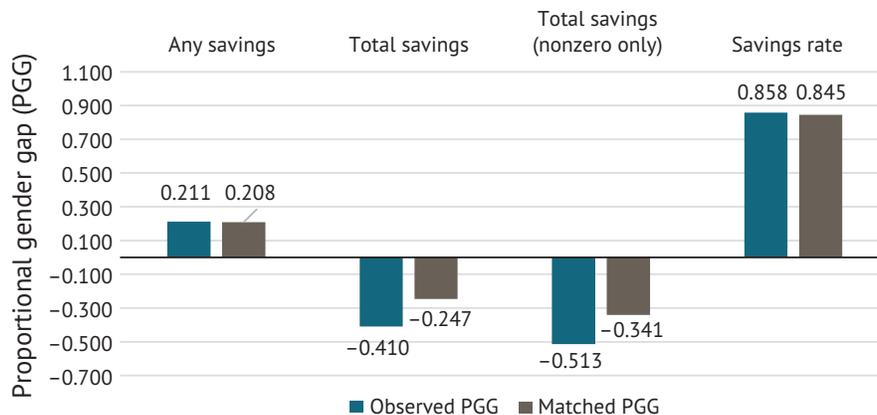


Matching significantly reduces the gender gap favoring men both in total savings over 12 months (by 40%) and in the amount saved in formal accounts (by 138%). However, matching has no effect on whether any savings are reported. Both the observed and matched gender gaps in any reported savings and in the savings rate remain positive and significant¹¹ (Figure 9 and Table 2, columns 3 and 4). That is, women business owners, even when matched with similar men, are 21% more likely to save at all and to save more than men (about 85% more) in relation to their total annualized earned incomes. However, the large *negative* gender gaps in total savings favoring men (−0.410 observed and −0.247 after matching) imply that the gender gap in savings favoring men business owners is due to men’s higher earned incomes, the effects of which are only partially offset by women’s significantly more intensive saving efforts. The estimates in Table 2 also indicate that women business

¹¹ The savings rate is significant at only the 0.10 level.

owners whose characteristics and resources are more similar to men's save significantly more in formal accounts and significantly less in ROSCAs.

Figure 9. Observed and matched estimates of proportional gender gaps in savings



Source: Table 2.

Note: The savings rate is the ratio of reported total savings during the last 12 months to annualized monthly average total earnings during the last 12 months.

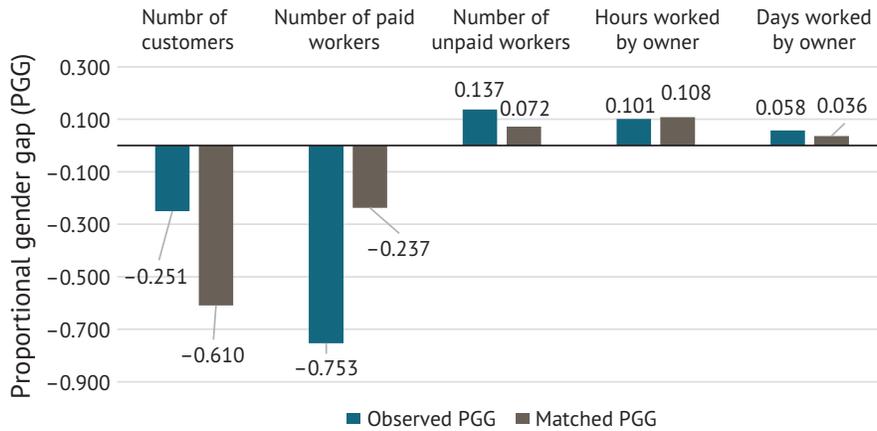
5.3. Other business outcomes

Sharp gender differences favoring men are also observed in other business outcomes. Women business owners have 25% fewer customers, employ 75% fewer paid workers and 14% more unpaid workers, and work 10% more hours in a typical day and 6% more days in a typical month in their primary businesses than men business owners. In addition, women are also 11% less likely to adhere to 13 recommended business practices (mainly related to record keeping), 43% less likely to have any current business loans and 34% less likely to make five key household decisions themselves (Table 3, column 2).

Matching significantly *increases* the PGG favoring men in the number of primary business customers (by 143%) so that, even after adjusting for the additional endowments of men business owners, women business owners experience significantly larger disadvantages on the demand side (Table 3, column 4 and Figure 10). This larger residual gender gap may be due partly to gender discrimination by customers. While we are not aware of studies that explore gender discrimination by customers in similar settings, experimental research indicates that discrimination by customers is widespread (Leonard and colleagues, 2010).

Matching significantly reduces (by 69%) the gender gap favoring men in the number of paid workers and the one favoring women in the number of unpaid workers (by 48%), implying that businesswomen with more resources will replace unpaid by paid workers in their firms. Matching reduces the small gender gap favoring women in the number of days worked in a typical month (by 37%), without having a significant effect on the number or hours worked in a typical day, suggesting rigidities in the allocation of women's time to their firms which does not vary with women having more favorable characteristics or additional resources.

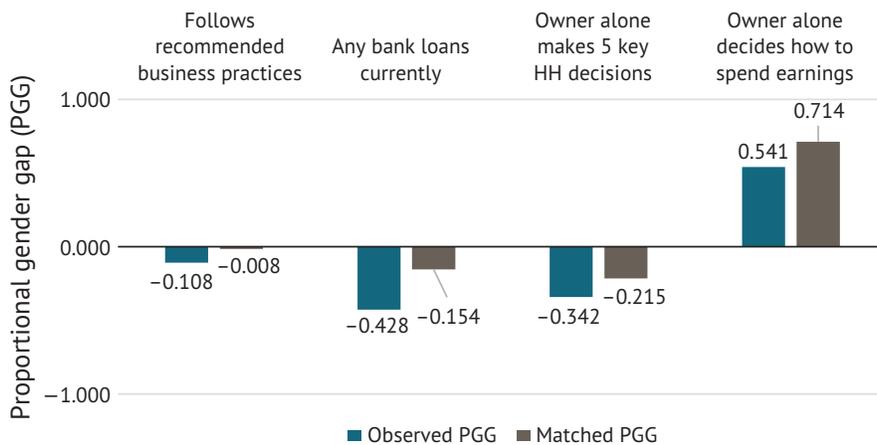
Figure 10. Observed and matched estimates of proportional gender gaps in numbers of customers, workers and own labor inputs in primary businesses



Matching, however, effectively erases the pre-matching advantage of men in adherence to recommended business practices (Table 3, column 4 and Figure 11). In other words, the business practices of women are not significantly different from those of men with similar endowments. One possible interpretation of this finding is that there is no residual gender gap in this outcome because business practices are not subject to the forces of gender discrimination and other unobserved factors in the same way that other business outcomes are. This also implies that women’s capacity to take advantage of quality business training courses should not be affected negatively by gender stereotyping or discrimination.

Matching also significantly decreases (by 64%) the gender gap favoring men in having any bank loans currently, while leaving a still significant negative residual PGG (of -0.154), indicating the seriousness of the obstacle women face in accessing credit. Matching also significantly reduces (by 37%) the gender gap favoring men in intra-household decision-making while significantly increasing (by 32%) a gender gap favoring women in deciding how to spend business earnings, suggesting the beneficial empowerment effects of policies that seek to increase businesswomen’s endowments.

Figure 11. Observed and matched estimates of proportional gender gaps in business practices, access to credit and agency



6. Discussion

There are some similarities but mostly large gender differences in characteristics and resources in this random sample of Indonesian businesswomen and businessmen. Similarities include household size, proportions married, average experience in the business and cognitive ability—the latter despite the fact that more men than women (9 percentage points more) have completed secondary schooling. The largest gender differences occur with respect to the type of business operated and the total value of business capital. Proportionately more women business owners operate ‘consumer facing’ restaurants and retail shops which have been hard hit by the pandemic, while proportionately more men business owners operate other (unspecified) types of businesses as well as service and processing businesses, which have globally weathered the pandemic lockdowns better.

There are also sharp differences favoring men in all sources of monthly earned income, including profits from the primary business during the last 12 months, which accounts for more than half of total earned income from all sources. A main finding of the study is that 40% of gaps in total earned income favoring men businessowners remain unexplained when women businessowners are compared to their men counterparts with similar characteristics and resources (e.g., demographic characteristics, education, cognitive ability and risk taking, experience, type of business, business capital and household assets). Residual gender gaps in such cases are usually presumed to be due to unobserved other factors such as gender discrimination in the household, community and business environments, as well as unobserved individual characteristics that the analysis did not pick up (e.g., ambition, self-confidence). While the study was not able to unpack these residual gender gaps to assess their relative importance, the findings are consistent with the view that discrimination by customers and gender rigidities in women’s work time allocation are important contributors to persistent gender inequalities in business outcomes.

With fewer paid workers, and despite having fewer customers, women report working more hours at their primary businesses in a typical day on average (8.6 hours versus 7.6 hours per day reported by men). That matching does not significantly affect the number of hours worked by women in a typical day implies that the greater number of hours women work in their businesses is not easily altered by increasing their endowments. This may be related to the type of businesses women run or their greater difficulty in hiring paid labor and suggests that women business owners must have encountered severe time conflicts as pandemic lockdowns compelled them to devote significantly more time to unpaid household and care work. Solutions call for a quick expansion of access to reliable, affordable and quality childcare and eldercare arrangements for the self-employed. In economies where childcare services are available, small public grants to pay for these services may help businesswomen weather economic shocks, as it was documented in Croatia after the 2008 financial crisis (Srhoj and colleagues, 2021). Where child and elder care services are not readily available (as is the case of most developing economies), a first or concurrent step is to increase their supply. Government stewardship is essential to define sustainable care financing models and establish close collaboration with the private sector in service financing and provision.

The large residual gender gaps favoring men business owners in savings (25% in total savings after matching) are mainly due to their higher incomes. Savings is important for many reasons, including as a partial source of financing capital investment (including both physical and working capital) and for providing a cushion that allows business owners to take on more risk. Over time, the strong linkages between earnings, savings, capitalization and risk taking can produce a vicious cycle in which women's low earnings lead to lower savings, lower capitalization and reduced risk taking, leading to even lower earnings.

This vicious cycle can be broken by strengthening businesswomen's access to business capital, bank accounts and savings as part of Covid-19 relief and MSME recovery programs. These programs should follow what is known about best practices in the design of these services to both reach businesswomen and have them effectively use them. Importantly, to implement and sustain these practices, financial service providers, including banks, cooperatives, mobile money operators and fintechs, need to embrace the business market proposition of serving women clients and eliminate possible biases against women in service provision. This requires the commitment of financial regulators and collaboration with private sector providers, gender champions in the financial sector, incentives to financial sector providers to target the women's market, and good gender data to design financial and insurance products that help overcome the constraints women face in the financial and business environments and to monitor their usage (Data2X and Financial Alliance for Women, 2020; World Bank, 2016; Koshy and Sanchez, 2021).

The finding that the business practices of women are not significantly different from those of men when endowments are equalized suggests that these practices are not subject to the forces of gender discrimination and other unobserved factors in the same way that other business outcomes are. This is good news and implies that women's capacity to take advantage of business training courses should not be affected negatively by gender stereotyping (provided that the training is gender friendly). In support of the benefits of business training for these women, a short, quality financial literacy group training plus three group practice sessions offered by Mercy Corps Indonesia increased the profits of women's firms in this sample significantly (Buvinic and colleagues, 2020 and 2021). Training programs for businesswomen need not be long but should include access to and training on mobile phones and bank or mobile money accounts, and soft skills training that targets increasing women's self-confidence for risk-taking in business decisions.

The policy suggestions mentioned above should be implemented in the short term, as part of economic recovery programs for the majority of MSMEs in Indonesia. Over the long term, to level the playing field for businesswomen and help equalize business outcomes, research by Goldstein and colleagues (2019) suggests that more women should enter the more profitable sectors currently dominated by men. In this Indonesia case, however, the sharp differences in the types of businesses owned by women compared to men does not appear to be a major contributor to women's lower profits. Simulations reported in Table A-3 indicate that changing the types of businesses owned by women to make them the same as

those owned by men (i.e., those concentrated in the services, processing and other sectors), without changing their profitability, would only increase women's average monthly primary business profits by less than 4%, whereas changing the profitability of the current mix of women-owned businesses to make them the same as men's, would increase women's average monthly profits by 88%. The analysis in this paper suggests that the search for best practices should particularly focus on effective ways to address the discriminatory forces in community, business and household environments that disadvantage women owned businesses, even when they have equal access to resources and regardless of business type.

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Tables

Table 1. Results for earned income by source

Earned Income Outcomes	N	Observed PGG	Matched PGG	Difference (DIF) (4)=(3)-(2)	Absolute Value of DIF as % of Observed PGG (5)=100*abs[(4)/(2)]
	(1)	(2)	(3)	(4)	(5)
Total earned income	4,668	-0.5326***	-0.3992***	0.133***	25.0%
Total profits (primary + secondary)	4,668	-0.4696***	-0.2745***	0.195***	41.5%
Primary business profits	4,670	-0.4418***	-0.2708***	0.171***	38.7%
Second business profits (including WBOs without second business)	4,687	-0.6411***	-0.2919**	0.349***	54.5%
Has second business	4,761	-0.1729	-0.1173	0.056	32.2%
Second business profits (conditional on having second business)	795	-0.5671***	-0.3149**	0.252***	44.5%
Other income	4,761	-0.7616	-0.8337**	-0.072	9.5%
Other business profits	4,761	-0.7924	-0.9794*	-0.187	23.6%
Other wage/salary income	4,761	-0.6889***	-0.4904***	0.199***	28.8%

*Significant at 0.05 level, **Significant at 0.01 level, ***Significant at 0.001 level.

Notes:

(1) PGG refers to proportional gender gap in equations (1) and (2), while DIF refers to the matched PGG minus the observed PGG in equation (3).

(2) The significance levels (all of which are based on estimated standard errors adjusted for clustered sampling at the village level) in columns 2 and 3 are for a test of the hypothesis that the PGGs in equations (1) and (2) are equal to zero, whereas the significance levels in column 4 is for a test that the DIF in equation (3) is equal to zero (based on estimates of β in equation (4)).

(3) Variations in the sample size (N in column 1) reflect the differing numbers of outcome values on support in the PSM, which was done for each outcome separately.

Table 2. Results for personal savings of business owners

Savings Outcome	N	Observed PGG	Matched PGG	Difference (DIF) (4)=(3)-(2)	Absolute Value of DIF as % of Observed PGG (5)=100*abs[(4)/(2)]
	(1)	(2)	(3)	(4)	(5)
Total savings (all WBOs)	4,745	-0.410**	-0.247*	0.163***	39.7%
Any savings	4,761	0.211***	0.208***	-0.003	1.6%
Total savings (conditional on having any savings)	3,680	-0.513**	-0.341***	0.172*	33.5%
Formal savings (all WBOs)	4,754	-0.651**	-0.331*	0.321***	49.2%
Any formal savings	4,761	-0.185*	0.070	0.255***	138.0%
Formal savings (conditional on having any formal savings)	1,233	-0.565**	-0.491**	0.075**	13.2%
Savings at home (all WBOs)	4,756	-0.474**	-0.407***	0.067	14.1%
Any savings at home	4,761	0.128	0.081	-0.047	36.9%
Savings at home (conditional on having any savings at home)	1,661	-0.533***	-0.436***	0.097	18.2%
Informal savings (all WBOs)	4,759	0.515	0.499*	-0.016	3.0%
Any informal savings	4,761	1.628***	1.597***	-0.031	1.9%
Informal savings (conditional on having any informal savings)	768	-0.389	-0.440**	-0.052	13.2%
ROSCA savings (all WBOs)	4,760	0.543	0.361	-0.181*	33.4%
Any ROSCA savings	4,761	0.958***	0.844***	-0.114**	11.9%
ROSCA savings (conditional on having any ROSCA savings)	1,990	-0.204	-0.243	-0.039	19.4%
Other savings (unconditional)	4,759	-0.028	-0.086	-0.058	209.3%
Any other savings	4,761	0.344***	0.304***	-0.040	11.5%
Other savings (conditional on having any other savings)	673	-0.314	-0.417	-0.103	32.8%
Savings rate (proportion of total earned income, all WBOs)	4,654	0.858	0.845	-0.013	1.6%

*Significant at 0.05 level, **Significant at 0.01 level, ***Significant at 0.001 level.

Notes:

(1) PGG refers to proportional gender gap in equations (1) and (2), while DIF refers to the matched PGG minus the observed PGG in equation (3).

(2) The significance levels in columns 2 and 3 (all of which are based on estimated standard errors adjusted for clustered sampling at the village level) are for a test of the hypothesis that the PGGs in equations (1) and (2) are equal to zero, whereas the significance levels in column 4 is for a test that the DIF in equation (3) is equal to zero (based on estimates of β in equation (4)).

(3) Variations in the sample size (N in column 1) reflect the differing numbers of outcome values on support in the PSM, which was done for each outcome separately.

Table 3. Results for other business outcomes

Other Business Outcome	N	Observed PGG	Matched PGG	Difference (DIF) 4=(3)-(2)	Absolute Value of DIF as % of Observed PGG (5)=100*abs[(4)/(2)]
	(1)	(2)	(3)	(4)	(5)
Number of customers, primary business	4,756	-0.251	-0.610***	-0.359***	143.4%
Number of customers, second business (all WBOs)	4,760	0.060	0.183	0.123	203.6%
Number of customers, second business (conditional on having a second business)	817	0.279	0.324	0.045	16.1%
Number of paid workers, primary business	4,761	-0.753***	-0.237**	0.516***	68.5%
Number of paid workers, second business (all WBOs)	4,761	-0.757***	-0.253*	0.504***	66.6%
Number of paid workers, second business (conditional on having a second business)	818	-0.706***	-0.296**	0.411***	58.1%
Number of unpaid workers, primary business)	4,761	0.137***	0.072**	-0.065***	47.6%
Number of unpaid workers, second business (all WBOs)	4,761	-0.111	-0.095	0.016	14.8%
Number of unpaid workers, second business (conditional on having a second business)	818	0.075	0.040	-0.035***	46.1%
Hours worked by owner, primary business	4,761	0.101**	0.108***	0.007	6.7%
Hours worked by owner, second business (all WBOs)	4,761	-0.273*	-0.084	0.189***	69.3%
Hours worked by owner, second business (conditional on having a second business)	818	-0.121	-0.018	0.103***	84.8%
Days worked by owner, primary business	4,761	0.058***	0.036***	-0.021***	37.2%
Days worked by owner, second business (all WBOs)	4,761	-0.132	-0.136	-0.004	2.9%
Days worked by owner, second business (conditional on having a second business)	818	0.049	0.000	-0.049***	99.8%
Adherence to 13 recommended business practices	4,761	-0.108*	-0.008	0.100***	92.9%
Owner has any current bank loans	4,761	-0.428***	-0.154***	0.273***	63.9%
Owner alone makes five key household decisions	4,761	-0.342***	-0.215***	0.127***	37.1%
Owner alone has access to business earnings	4,761	2.476***	2.481***	0.005	0.2%
Owner alone decides how to spend business earnings	4,761	0.541***	0.714***	0.173***	32.0%

*Significant at 0.05 level, **Significant at 0.01 level, ***Significant at 0.001 level.

Notes:

(1) PGG refers to proportional gender gap in equations (1) and (2), while DIF refers to the matched PGG minus the observed PGG in equation (3).

(2) The significance levels in columns 2 and 3 (all of which are based on estimated standard errors adjusted for clustered sampling at the village level) are for a test of the hypothesis that the PGGs in equations (1) and (2) are equal to zero, whereas the significance levels in column 4 is for a test that the DIF in equation (3) is equal to zero (based on estimates of β in equation (4)).

(3) Variations in the sample size (N in column 1) reflect the differing numbers of outcome values on support in the PSM, which was done for each outcome separately.

Annex. Description of the data

Table A-1 and A-2 below report the sample means and standard deviations by sex of all business owners' outcomes (Table A-1) and of their predetermined characteristics and resources (Table A-2) as well as the sample sizes. Table A-3 reports the results of a simulation of the effects on the profitability of women-owned businesses of changing their types of businesses to be the same as men's versus changing the profitability of their current types of businesses to be the same as men's. The definitions and data sources of the variables used in the paper are as follows:

Total earned income is the sum of business owners' total profits and other income in millions of Indonesia Rupiah (Rp.). Total profits are the sum of average monthly profits during the past 12 months in the primary and second business, with each based on a single question. Unconditional profits in the second business are assumed to be zero if the business owner reported not having any second business. Other income is based on separate questions on other business profits from any additional businesses owned and on the amount of any wage and salary income received by the business owner.

Total Savings refers to business owners' total reported savings during the past 12 months in all savings instruments in millions of Indonesia Rupiah (Rp.). It is based on responses to a question whether any amount was saved during the reference period (any savings) and if so, how much was saved in each of following savings instruments: formal bank account, electronic savings account (very few observations), hiding place at home, with friends or family, informal saving network, rotating saving/credit association (ROSCA), or all other saving instruments (including cooperative and community savings funds). The questionnaire does not provide any opportunity to report negative savings (dissaving). The savings rate is equal to total savings during the past 12 months divided by total monthly earnings multiplied by 12.

Total value of business capital refers to the current market value of all types of business capital used in all businesses owned in millions of Indonesia Rupiah (Rp.). It is based on questions of whether the business owner has any of six different types of business capital (i.e., own shop premises, advances paid for rented shop, furniture and fixtures, equipment, inventories, and other), and if so, its current value (i.e., "how much would you sell this for?").

Labor inputs is the number of days (hours) that business owners report that they work in their businesses in a typical month (day).¹² This variable is the product of responses to the following two questions: (1) "How many days do you work in your primary (second) business during a typical month?" and (2) "How many hours per day do you work in your primary (second) business?"

¹² Business owners' total labor inputs in both primary and secondary businesses is not meaningful because of their tendency to report the same labor inputs in both businesses.

Business practices is the mean proportion of the following 13 recommended business practices that business owners report that they follow: (1) asked a supplier which products are selling well in your industry, (2) used a special offer to attract customers in the last three months, (3) done any form of advertising in the last six months, (4) done anything to measure the effectiveness of advertising (coded zero if (3) is no), (5) attempted to negotiate with a supplier for a lower price in the last three months, (6) have a record-keeping system that allows you to know your current inventory, (7) keep written business records, (8) record every purchase or sale (coded zero if (7) is no), (9) know cash on hand at any point in time (coded zero if (7) is no) (10) use records to know whether sales of a particular product are increasing or decreasing from one month to another (coded zero if (7) is no), (11) worked out the cost of each product sold, (12) have a written monthly budget, and (13) have records needed to apply for a bank loan.

Household decision-making is the proportion of the following five household decisions for which business owners indicate that that they are the sole decision-maker: (1) whether to purchase an appliance for the home, (2) how household members may work outside the home, (3) whether to support other family members, (4) whether to save for the future, and (5) whether to sign up for a new banking product.

Asset index is based on the household's reported ownership (Yes/No) of 20 consumer durables, indicators referring to housing characteristics (i.e., number of rooms, materials used in walls and roof, water source) and an indicator of household food sufficiency. The asset index is calculated as the first principal component of the indicators, as is the usual practice (Filmer and Scott 2012).

Table A-1. Sample means, standard deviations and sample size by sex of business owners' outcomes

Outcome	Women Business Owners			Men Business Owners		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Total earned income	2835	1.913	3.290	1967	4.138	8.439
Total profits (primary + secondary)	2835	1.698	3.159	1967	3.253	7.100
Primary business profits	2836	1.550	3.014	1968	2.815	5.474
Second business profits (including WBOs without second business)	2847	0.150	0.764	1974	0.436	2.859
Has second business	2848	0.156	0.362	1976	0.191	0.393
Second business profits (conditional on having second business)	442	0.969	1.724	376	2.289	6.225
Other income	2852	0.214	0.810	1976	0.882	4.360
Other business profits	2852	0.132	0.660	1976	0.619	4.257
Wage/salary income	2852	0.081	0.461	1976	0.263	0.991
Total savings (unconditional)	2838	6.097	13.239	1972	10.41	38.41
Any savings	2850	0.837	0.369	1976	0.692	0.462
Total savings (conditional on having any savings)	2366	7.314	14.190	1358	15.12	45.52
Formal savings (all WBOs)	2848	1.922	8.427	1973	5.564	36.28
Any formal savings	2850	0.237	0.425	1976	0.295	0.456
Formal savings (conditional on having any formal savings)	671	8.159	15.837	580	18.93	65.03
Savings at home (all WBOs)	2848	1.453	4.167	1975	2.793	8.860
Any savings at home	2850	0.367	0.482	1976	0.325	0.468
Savings at home (conditional on having any savings at home)	1042	3.971	6.122	641	8.605	13.86
Informal savings (all WBOs)	2850	0.367	1.192	1976	0.246	1.911
Any informal savings	2850	0.247	0.431	1976	0.095	0.293
Informal savings (conditional on having any informal savings)	702	1.489	2.026	187	2.601	5.711
ROSCA savings (all WBOs)	2851	1.501	4.425	1976	0.975	3.696
Any ROSCA savings	2850	0.532	0.499	1976	0.272	0.445
ROSCA savings (conditional on having any ROSCA savings)	1516	2.823	5.753	537	3.586	6.399
Other savings (unconditional)	2850	0.844	5.388	1976	0.877	5.528
Any other savings	2852	0.601	0.490	1976	0.447	0.497
Other savings (conditional on having any other savings)	473	5.086	12.394	229	7.564	14.63

Outcome	Women Business Owners			Men Business Owners		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Savings rate (proportion of total earned income, all WBOs)	2823	0.421	0.709	1965	0.233	0.484
Number of customers, primary business	2847	221.0	452.381	1972	296.4	688.2
Number of customers, second business (all WBOs)	2848	17.70	133.927	1975	17.01	113.4
Number of customers, second business (conditional on a second business)	443	113.8	323.380	377	89.09	247.1
Number of paid workers, primary business	2849	0.192	1.211	1976	0.788	2.642
Number of paid workers, second business (all WBOs)	2849	0.047	0.466	1976	0.197	1.669
Number of paid workers, second business (conditional on a second business)	443	0.305	1.149	378	1.032	3.704
Number of unpaid workers, primary business)	2849	2.130	1.317	1976	1.872	0.838
Number of unpaid workers, second business (all WBOs)	2849	0.254	0.666	1976	0.289	0.673
Number of unpaid workers, second business (only second businesses)	443	1.628	0.778	378	1.513	0.718
Hours worked by owner, primary business	2849	8.421	3.317	1976	7.631	3.014
Hours worked by owner, second business (all WBOs)	2849	0.695	2.033	1976	0.969	2.534
Hours worked by owner, second business (conditional on a second business)	443	4.442	3.105	378	5.063	3.585
Days worked by owner, primary business	2849	28.74	3.663	1976	27.17	5.209
Days worked by owner, second business (all WBOs)	2849	3.393	8.929	1976	3.981	9.443
Days worked by owner, second business (conditional on a second business)	443	21.76	10.559	378	20.81	10.77
Adherence to 13 recommended business practices	2846	0.228	0.186	1974	0.256	0.218
Any business loans during the past 12 months	2850	0.234	0.424	1976	0.415	0.493
Owner alone has access to business earnings	2846	0.188	0.391	1974	0.054	0.226
Owner alone decides how to spend business earnings	2846	0.684	0.465	1974	0.441	0.497

Table A-2. Means, standard deviations and sample size by sex of business owners' predetermined characteristics and resources

Resource	Women Business Owners			Men Business Owners		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Business owner's age	2852	37.560	7.823	1976	39.368	8.277
Business owner is currently married	2852	0.913	0.282	1976	0.901	0.298
Number of children in the household	2852	1.506	0.869	1976	1.409	0.934
Household size	2852	4.322	2.002	1976	4.323	1.457
Business owner is head of household	2852	0.075	0.264	1976	0.862	0.345
Highest level of schooling completed: Upper secondary	2852	0.388	0.487	1976	0.483	0.500
Cognitive ability (score 0–4)	2852	3.066	0.868	1976	3.105	0.900
Number of years working in the primary business	2849	8.098	7.210	1976	8.481	7.257
Business owner's willingness to take risks (score 1–10)	2844	3.993	2.419	1973	4.797	2.769
Household asset index	2847	0.040	1.818	1975	−0.058	1.932
Business owner is the head of household	2851	0.476	0.500	1975	0.613	0.487
Business owner involved in voluntary activities in past year	2848	0.131	0.337	1976	0.202	0.402
Business owner has bank account in own name	2851	0.476	0.500	1975	0.613	0.487
Business owner has smart phone	2851	0.369	0.483	1976	0.445	0.497
Primary business started more than 10 years ago	2849	0.372	0.484	1976	0.399	0.490
Primary business is registered with the government	2849	0.107	0.310	1976	0.166	0.372
Total value of the business owner's capital assets (Rp. millions)	2847	20.897	72.004	1975	60.028	172.183
Other household members help run the primary business	2849	0.744	0.437	1976	0.664	0.472

Table A-3. Simulation of the effects on the profitability of women-owned businesses of changing business types versus changing business profitability

Type of Business	Current types of Primary Business (%)		Average Monthly Primary Business Profits (Rp. Millions)			Simulations: Women's Monthly Primary Business Profits by Type of Business (Rp. Millions)		
	Women	Men	Women	Men	Ratio: W/M	Actual (reference)	Simulation 1	Simulation 2
	(1)	(2)	(3)	(4)	(5)=(3)/(4)	(6)=(1)*(3)	(7)=(2)*(3)	(8)=(1)*(4)
Grocery	5.6%	5.7%	1.932	3.154	0.613	0.108	0.110	0.176
Restaurant	30.6%	21.3%	1.659	2.327	0.713	0.508	0.353	0.713
Retail shop	48.6%	21.4%	1.428	3.327	0.429	0.694	0.305	1.616
Services	7.4%	16.4%	1.429	2.408	0.593	0.106	0.235	0.179
Processing	1.1%	5.3%	1.190	2.857	0.417	0.013	0.063	0.031
Other	6.7%	29.9%	1.812	2.952	0.614	0.121	0.542	0.197
All business types	100.0%	100.0%	1.550	2.815	0.551	1.550	1.608	2.912

Notes:

Simulation 1: Women have the same types of businesses as men, but with their current profitability.

Simulation 2: Women have their current types of businesses, but with the same profitability as men's.