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Non-Technical Summary

The gender wage gap in formal labor markets is well-documented, with women earning less than men due to factors such as occupational choice and part-time work, although a portion remains unexplained and may be attributed to discrimination. While there is extensive research on gender disparities in formal employment, evidence on microentrepreneurs—particularly in Brazil—remains scarce. This study investigates revenue differences between male and female microentrepreneurs in Brazil, analyzing transaction data from Individual Microentrepreneurs (MEI) in 2023, including instant payments (Pix), debit and credit card transactions, and bank slips. By aggregating revenues from both personal and business accounts, the study provides a comprehensive revenue estimate, enabling a robust gender gap analysis.

The findings reveal significant gender disparities between microentrepreneurs, with women having revenues 31% lower than men without control variables. Adjusting for economic activities reduces the gap to 23%, suggesting that occupational segmentation explains about a quarter of the disparity. Moreover, the gender gap among microentrepreneurs with prior formal job experience is 7 percentage points lower, likely due to lower skill disparities. Other controls like microentrepreneur's age, firm's age, and geographical location do not materially change this estimate.

The research further investigates individuals who are formally employed while simultaneously engaging as microentrepreneurs. Within this sample, the disparity in revenue is significantly reduced, approximately between 5 and 8%.

A comparative analysis with Brazil's formal labor market, using RAIS data, reveals the gender wage gap in formal employment (9.6%) is less than a third of that among microentrepreneurs. However, there is an issue with this comparison: while it is possible to adjust for workload in formal job analysis, data on workload is unavailable for microentrepreneurs.

Methodologically, the study advances the literature by leveraging large-scale administrative data (4 million microentrepreneurs across 550 economic activities) and incorporating both personal and business account transactions, offering a more accurate revenue measure. Its focus on very small entrepreneurs—often overlooked in previous research—provides novel insights into a segment where business and personal finances frequently overlap.

By identifying key determinants of revenue differentials, such as economic sector and prior formal job experience, this research could help policymakers in formulating strategies aimed at diminishing gender inequality in microentrepreneurship.

Sumário não Técnico

A disparidade salarial de gênero no mercado de trabalho formal é bem documentada, com mulheres ganhando menos que os homens devido a fatores como escolha ocupacional e horas trabalhadas, embora uma parcela permaneça inexplicada e possa ser atribuída à discriminação. Embora exista uma extensa pesquisa sobre disparidade de gênero no emprego formal, evidências sobre microempreendedores — particularmente no Brasil — permanecem escassas. Este estudo investiga as diferenças de receita entre microempreendedores homens e mulheres no Brasil, analisando dados de transações de Microempreendedores Individuais (MEI) em 2023, incluindo pagamentos via Pix, cartão de débito e crédito e boletos bancários. Ao agregar os recebimentos de contas pessoais e empresariais, o estudo fornece uma estimativa abrangente da receita, permitindo uma análise robusta da disparidade de gênero.

Os resultados revelam disparidades de gênero significativas entre microempreendedores, com as mulheres apresentando receitas 31% menores que os homens sem considerar variáveis de controle. Quando se controla para a atividade econômica, essa diferença cai para 23%, sugerindo que a segmentação ocupacional explica cerca de um quarto da disparidade. Além disso, a disparidade de gênero entre microempreendedores com experiência profissional formal anterior é 7 pontos percentuais menor, provavelmente devido a menores disparidades de qualificação. Outras variáveis de controle, como idade do microempreendedor, idade da empresa e localização geográfica, não alteram materialmente a estimativa.

A pesquisa investiga ainda indivíduos que estão formalmente empregados e, ao mesmo tempo, atuam como microempreendedores. Nessa amostra, a disparidade de renda é significativamente menor, aproximadamente entre 5 e 8%.

Uma análise comparativa com o mercado de trabalho formal brasileiro, utilizando dados da RAIS, revela que a disparidade salarial entre gêneros no emprego formal (9,6%) é menos de um terço daquela entre microempreendedores. No entanto, há um problema com essa comparação: embora seja possível ajustar a carga horária na análise de empregos formais, dados sobre carga horária não estão disponíveis para microempreendedores (MEIs).

Metodologicamente, o estudo avança a literatura ao alavancar dados administrativos em larga escala (4 milhões de microempreendedores em 550 atividades econômicas) e incorporar transações de contas pessoais e empresariais, oferecendo uma mensuração de renda mais precisa. Seu foco em microempreendedores — frequentemente negligenciado em pesquisas anteriores — fornece novos insights sobre um segmento onde as finanças empresariais e pessoais frequentemente se sobrepõem.

Ao identificar os principais determinantes dos diferenciais de receita, como setor econômico e experiência profissional formal anterior, esta pesquisa pode ajudar os formuladores de políticas a desenharem estratégias destinadas a diminuir a desigualdade de gênero no microempreendedorismo.

Gender Gap among Microentrepreneurs in Brazilⁱ

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This version: August 2025

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Abstract

This paper estimates the gender revenue gap among Brazilian microentrepreneurs, sheds a light on the factors behind these disparities, and compares it with the formal job market. We collect payment data from all individual microentrepreneur businesses that remained open throughout the entire year of 2023, and from the owners of the businesses. The empirical approach consists of cross-section regressions comparing this revenue estimate for men and women, controlling for a set of variables, like geographic location and economic activity. Our results indicate that women microentrepreneurs have revenues 31% lower than those of men without any control. When controlling for economic activity, this gap decreases to 23%, so occupation choices account for a quarter of the original gender gap. Other controls like microentrepreneur's age, firm's age, and geographical location do not materially change this estimate. Prior formal job experience decreases the gender gap by 7 percentage points. We also estimate a 10% wage gender gap for the formal job market in 2023, which is 1/3 of the microentrepreneurs' revenue gender gap.

Keywords: Gender Gap; Entrepreneurship; Microentrepreneur; Job market.

JEL Classification: J16; L26; J31; O17.

ⁱ We are grateful to the useful comments from Solange Guerra and an anonymous referee, as well as from participants from the XXV Brazilian Finance meeting.

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1) Introduction

There is an extensive empirical literature on gender wage gap in formal job market, documenting a lower salary for women. The factors behind this gap include differences in occupation and industry, part-time jobs, and education. These factors are unable to explain all the gender salary gap, so that some gender discrimination is probably the cause for the remaining gap (Blau and Khan 2017, Gharehgozli and Atal 2020). Results on the gender wage gap are also found in Brazil, such as in the article by Tenoury, Madalozzo, and Martins (2021), which observes a relationship between gender wage gap and labor market participation rates.

Among entrepreneurs, there is also evidence of a gender gap. Nix, Gamberoni and Heath (2015), Bardasi et al. (2011) and Hardy and Kagy (2018) document that women entrepreneurs have lower performance, even after accounting for several explanation factors. However, the evidence for microentrepreneurs is scarce, especially for Brazil.

This study aims to explore the revenue differences between men and women by analyzing the revenues of microentrepreneurs in Brazil, as well as attempting to determine the factors behind these disparities. In addition, the study compares these revenue differences among microentrepreneurs with the wage differences of individuals who had formal employment.

For this purpose, we performed two empirical analyses with different datasets. The first comprises payment data from microentrepreneurs to estimate their revenues and the gender revenue gap; while the second analysis adds data from formal employment in order to make a comparison of the gender gap of microentrepreneurs and in the formal job markets.

In our main analysis, we collect transaction data from all Individual Microentrepreneurs (MEI)¹ that remained open throughout the entire year of 2023. To estimate the revenues of the microentrepreneurs, four receipt flows were aggregated: instant payments (Pix) received, debit card payments, credit card payments, and bank slips. For these very small entrepreneurs, it is common to use their personal bank accounts

¹ MEI are a specific type of enterprise in Brazil that can have at maximum one employee besides the owner. It is similar to a self-employed professional, but with a business tax identification.

for running the business. For this reason, we consider receipts from both personal and business accounts. Our main empirical approach consists in cross-section regressions comparing this revenue estimate for men and women, controlling for a set of variables, like geographic location and economic activity.

Our results indicate that gender inequality is also present among microentrepreneurs. Female microentrepreneurs have revenues 31% lower than those of men without any controls. There are no meaningful changes in this estimate upon the addition of microentrepreneur's age and firm's age, as well as geographical location. However, when controlling for economic activities (CNAE), either alone or interacted with municipalities, there is a drop of about 8 percentage points in the women dummy. Controlling for economic activities, the coefficients for women are close to 23%, indicating that Economic Activities explain about a quarter of the original income differential.

This can be partially explained by occupational segmentation, where there is a tendency for workers to concentrate in certain sectors. Men and women tend to be concentrated in different sectors, with men present in segments with higher revenues than women's typical segments.

This main analysis does not include two important control variables: formal educational level and the number of hours worked by the entrepreneurs. While controlling for education would increase the gender gap, since women have higher education, the number of hours worked would decrease the gap, since men have a higher workload.

The primary analysis focuses on individuals who are solely engaged in microentrepreneurship. Additionally, we examine individuals who maintain formal employment while simultaneously participating in microentrepreneurial ventures, as a means of supplementing their income. Within this sample, the gender revenue disparity is markedly reduced, ranging from approximately 5% to 8%.

Moreover, we examine the effects of prior experience within the formal labor market on revenue outcomes. The gender disparity is reduced by 7 percentage points for individuals with previous formal job experience, irrespective whether the individual was

terminated or voluntarily resigned from the position. Previous experience may decrease skill discrepancies between males and females, thereby reducing the gender gap.

Our study also compares the entrepreneurship revenue gender gap with the formal wage gender gap. Using data from RAIS, an employer-employee dataset maintained by the Brazilian Ministry of Labor, we estimate the gender wage gap for 2023. The unconditional estimation shows that women earn, on average, 9.6% less than men in the formal labor market. This is less than 1/3 of the gender gap for microentrepreneurs revenue. Nevertheless, a problem arises with this comparison: whereas we can adjust for workload in formal data regressions, the workload data is not available for microentrepreneurs.

Our study contributes to the literature by providing evidence on the gender gap of very small microentrepreneurs, who are, in fact, in the borderline with self-employed professionals. Using administrative data from several payment types, we are able to estimate revenues from a large sample of microentrepreneurs (approx. 4 million) spread by a wide range of economic activities (550), giving robustness and representativeness to our results.

In this segment of very small microentrepreneurs, personal bank accounts are often used to receive business revenues. Our study innovates by considering payments from both personal and business bank accounts, giving a more comprehensive view of revenues.

The identification of the potential determinants of gender revenue differentials can help in the development of public policies, especially regarding occupation choices counselling for women.

The paper proceeds as follows: Section 2 contains a review of the literature; Section 3 describes the data; section 4 provides our methodology; section 5 shows and analyzes the results; and Section 6 concludes the paper.

2) Literature Review

Small, medium, and micro enterprises (SMMEs) represent 90% of the total number of businesses, 60 to 70% of employment, and 50% of GDP worldwide (World

Bank, 2024). However, despite its relevance gender inequalities are unfortunately also present in the revenues of microentrepreneurs. In fact, in all the countries (Ghana, Rwanda, Tanzania and the Republic of Congo) analyzed by Nix, Gamberoni, and Heath (2016), gender income disparities are larger for self-employed workers than for salaried workers.

The reasons behind the gender profit gap remain unknown. Key owner characteristics, such as industry, marital status, experience, education, number of children, and average monthly hours worked, fail to account for most of this gap (Hardy and Kagy, 2018).

According to (Nix et al., 2016), the gender earnings gap can be divided into a compositional effect and a structural effect. The compositional effect represents the portion of the earnings disparity that can be explained by observable factors such as marital status, experience, education, number of children, average weekly hours worked, and sector/industry. Regarding the compositional effect, they find that industry and monthly hours worked play more significant roles than human capital (education and experience) in explaining gender differences. The structural effect accounts for the part of the gap that can be not attributed to the returns on these factors, suggesting discrimination, as it represents the "unexplained" portion of the gap (Nix et al., 2016).

In the study by Hardy and Kagy (2018), it was found that the significant and persistent gender profit gap cannot be explained by the extensive set of firm and owner characteristics in the analysis. This suggests that external factors, beyond those related to the firm and its owner, are contributing to the disparity.

This earnings disparity among microentrepreneurs by gender varies across locations analyzed in different studies, but it is usually present. Hardy and Kagy (2018) show that, in Ghana, even within the same economic activity, businesses owned by men earn nearly twice the profits of those owned by women. In their study, the average woman earns 53% of what the average man earns. In this case, observable factors explain 25% of the difference, while 22% remain unexplained.

In the study by Daniels and Mead (1998), in Kenya, micro and small businesses owned by women earned lower profits than those owned by men, even after controlling for industry, education, credit, age, capital, and location. Similarly, Rijkers and Costa

(2012) found that businesses owned by women had significantly lower sales on average than those owned by men across Bangladesh, Ethiopia, Indonesia and Sri Lanka.

Gender revenue disparities can be partially explained by several factors. The first is related to the constraints women face when entering entrepreneurship. Studies indicate that women encounter more difficulty in obtaining loans, face asymmetric access to capital, and often start businesses with less financial capital than those led by men (Campos, 2011; Sabarwal and Terrell, 2008; El-Hamidi, 2011; Chaudhuri, Sasidharan and Raj, 2020). Furthermore, according to Brixiová and Kangoye (2016), female entrepreneurs are less likely to seek formal financing than men in Swaziland.

Because of these factors, women-owned businesses tend to be relatively smaller and younger, grow at a slower rate, exhibit higher informality rates, and have lower productivity (Campos, 2011; Sabarwal and Terrell, 2008; Rijkers and Costa, 2012). In Chaudhuri, Sasidharan, and Raj (2020), it is found that the average annual production of a woman-owned firm is 32 percentage points lower than that of a man-owned firm in India.

Bardasi et al. (2011) find that revenue differences could also be driven by disparities in human capital between men and women. Their analysis are based on a sample for Eastern Europe and Central Asia, Latin America, and Sub-Saharan Africa. Finally, another explanation for these differentials is the preferences of female entrepreneurs. Some women seek to balance work and family responsibilities, leading them to choose less productive but more flexible industries that allow for a better integration of domestic activities and market work (Nordman and Vaillant, 2014).

Thus, the selection of the occupational sector emerges as an important determinant of returns. There is evidence that female entrepreneurs tend to concentrate in industries with small but highly competitive businesses, which reduces opportunities for growth and performance (Nix, Gamberoni, and Heath, 2016).

However, empirical evidence shows that part of the revenue disparity between men and women persists even after controlling for economic activity, the entrepreneur's human capital, and the firm's level of physical capital (Nordman and Vaillant, 2014; Daniels and Mead, 1998). Furthermore, McKenzie and Woodruff (2015) identified in Bangladesh, Chile, Ghana, Kenya, Mexico, Nigeria and Sri Lanka, a positive correlation

between being a male entrepreneur and higher sales and profits, even after accounting for business practices.

Bernhardt et al. (2019) highlight that both men and women invest in businesses within their household in India, Sri Lanka, and Ghana. However, these businesses are typically male-owned. As a result, women often use their loans to invest in family businesses that they do not directly own.

Thus, women may choose to work in low-income industries within micro and small enterprises due to their limited access to credit and greater domestic responsibilities. This also encourages them to opt for occupations that can be performed from home.

3) Data

We build two datasets. The main one is a dataset with microentrepreneur information in 2023, while the secondary dataset includes formal jobs information in 2023.

The main dataset contains individual microentrepreneurs' information in 2023. To estimate the income of microentrepreneurs, we collect transaction data from all individual microentrepreneurs' businesses (MEIs²) that were active throughout the entire year of 2023, as well as from the owners of the businesses. As one individual can have only one MEI at a time, we have exactly one individual tax ID for each business tax ID. We aggregate our data at the tax id level. Moreover, we collected information about the owner's gender, birth year, and municipality, as well as the Economic Classification of the business. These data come from the registry of the Brazilian Tax Authority.

Our revenue estimation has four sources: Pix, debit card, credit card, and payment slip (the so-called "*boleto*" in Brazil). We consider receipts from both the business account and the owner's individual account. The sum of these components is our estimation of the MEI income.

Our revenue proxy has limitations. It might be overestimated, as some transactions may not be revenue but merely a financial transfer that the microentrepreneur is receiving

² MEI It is a simplified form of business registration designed for small entrepreneurs who work on their own or with at most one more employee. The MEI system was created to formalize informal workers, reduce bureaucracy, and offer tax and social security benefits. Only a subset of economic activities can be a MEI. In general, professions that require a university degree (e.g., medical doctor, lawyer, engineer, accountant) cannot set up a MEI.

personally or as a business. Moreover, our data do not have transactions made via Pix, where both sender and receiver have the same bank or Pix participant. This can underestimate revenue. Additionally, cash payments received by microentrepreneurs are also not accounted for, even though they constitute revenue.

We exclude from our dataset observations identified as “*pejotização*”, that is, workers who use an individual company (legal entity) to provide labor services exclusively to another company. This exclusion is justified because this relationship is more similar to that of employment than to the provision of services by an entrepreneur to a diversified base of clients. We exclude cases where transaction values of debit cards, credit cards and *boletos* were all zero and, in addition, the total number of transactions through Pix did not exceed 120 in the year. This filter will also exclude inactive firms. Moreover, we also exclude from our main microentrepreneurs sample those who have also a formal job in 2023. The idea is to build a sample with individuals that focus on entrepreneurship. However, we perform a robustness test (section 5.b) using individuals who are both microentrepreneur and have a formal job in 2023.

Our second dataset contains data from RAIS, an employer-employee dataset maintained by the Brazilian Ministry of Labor. We collect information also from 2023 about wages³, age of the worker, tenure in the job, municipality, formal education and occupation classification. The idea is to compare the gender gap in business revenues with the wage gap.

Table I shows the summary statistics of our two samples. In Panel A, we see that we have approximately 4.3 million microentrepreneurs in 2023, covering 550 different Economic Activities across 5,568 municipalities. In Panel B, we see that approximately 73 million individuals had formal employment also in 2023.

³ We adjust the wages by the number of weekly hours of the job contract.

Table I - Summary Statistics
Panel A – Microentrepreneurs Statistics

	Mean	Std. Dev.	1 st Quartile	Median	3 rd Quartile	Number of Observations
Male						2,248,798
Revenue (R\$ thousand)	126.51	124.64	44.70	84.72	159.06	
Entrepreneur Age (Years)	40.5	11.4	31	39	48	
Firm Age (Years)	4.4	3.8	2	3	6	
Female						2,121,419
Revenue (R\$ thousand)	92.97	99.42	32.97	60.58	112.56	
Entrepreneur Age (Years)	40.9	11.3	32	40	49	
Firm Age (Years)	4.6	3.7	2	3	6	
Total						4,370,217
Revenue (R\$ thousand)	110.23	114.33	38.02	71.79	136.04	
Entrepreneur Age (Years)	40.7	11.3	32	40	49	
Firm Age (Years)	4.5	3.8	2	3	6	

Panel B – Formal Wages statistics

	Mean	Std. Dev.	1 st Quartile	Median	3 rd Quartile	Number of Observations
Male						41,236,340
Monthly Wage	3,753.07	7,105.60	1,617.00	2,227.30	3,532.70	
Employee Age (Years)	37.14	12.14	27	36	46	
Job Tenure (Months)	45.82	73.79	5	16	50	
Female						32,374,316
Monthly Wage	3,517.59	6,240.66	1,523.10	2,017.70	3,510.32	
Employee Age (Years)	36.69	11.69	27	36	45	
Job Tenure (Months)	49.61	76.76	6	17	55	
Total						73,610,656
Monthly Wage	3,649.50	6,739.90	1,568.50	2,134.70	3,523.80	
Employee Age (Years)	36.94	11.95	27	36	45	
Job Tenure (Months)	47.49	75.13	6	16	52	

4) Methodology

Our econometric specifications are based on the cross-section comparison of microentrepreneur's revenue or formal wages. We have one set of econometric specifications for each dataset.

For the first dataset, with microentrepreneur's revenue, we estimate cross-section linear regressions with various levels of fixed effects, with the log of revenue as the dependent variable. Our baseline specification is the following:

$$\text{Log}(R_i) = \beta_1 G_i + \Lambda \mathbf{C}_i + \mu_i + v_i + \varepsilon_i, \quad (1)$$

where:

R_i is estimated revenue of microenterprise i in the full year of 2023;

G_i is a dummy variable equal to one if the owner of microenterprise i is a woman;

$\mathbf{C}_i$ is a set of microenterprise characteristics: age of the owner and age of the microenterprise, both expressed in years;

μ_i are fixed effects for the municipality of i ;

v_i are fixed effects for the 3-digit economic activity classification of i ; and

ε_i is the error term.

For the second dataset, with formal job's wages, we estimate cross-section linear regressions with various levels of fixed effects, with the log of wages as the dependent variable. Our full specification is the following:

$$\text{Log}(W_i) = \beta_1 G_i + \mathbf{\Lambda} \mathbf{C}_i + \mu_i + v_i + \delta_i + \varepsilon_i, \quad (2)$$

where:

W_i is the average monthly wage individual i in 2023, based on 44 hours/week;

G_i is the gender of the individual i ;

$\mathbf{C}_i$ is a set of individual characteristics: age of the worker and tenure in the job, in years;

μ_i are fixed effects for the municipality of i ;

δ_i are fixed effects for the race and formal education⁴ of i , and the employer's economic activity;

v_i are fixed effects for the occupation classification⁵ of i 's job; and

ε_i is the error term.

5) Results

a. Baseline

For revenue results, five econometric specifications were estimated using linear regression, with the log of revenue as the dependent variable. The first model includes

⁴ There are eleven classifications for formal education: no Schooling, some Elementary, Elementary, some Middle school, Middle school, some High School, High School (the base case dummy), some university study, bachelor degree, master degree and doctoral degree.

⁵ We use 3-digit occupation classification - *Classificação Brasileira de Ocupações* (CBO) from 2002.

only the binary variable for being female, which takes a value of 1 if the individual is female and 0 otherwise. Starting with the second model, the individual's age and firm age variables are added. The first two regressions did not include fixed effects, whereas in regressions 3 and 4, municipality and economic activity are included as fixed effects, respectively. Finally, specification 5 uses fixed effects for the interaction of municipality and economic activity. The results are presented in Table II.

Table II – Revenue Differential Regressions of MEIs

Dependent Variable: Log(Revenue)					
	(1)	(2)	(3)	(4)	(5)
Female	-0.311*** (0.0012)	-0.309*** (0.0012)	-0.308*** (0.0012)	-0.235*** (0.0012)	-0.232*** (0.0012)
Entrepreneur Age		-0.009*** (0.0000)	-0.010*** (0.0000)	-0.010*** (0.0000)	-0.010*** (0.0001)
Firm Age		0.014*** (0.0001)	0.016*** (0.0001)	0.014*** (0.0001)	0.018*** (0.0002)
Fixed Effects					
Economic Activity	No	No	No	Yes	N/A
Municipality	No	No	Yes	No	N/A
Munic. x Econ. Act.	No	No	No	No	Yes
# Municipalities	5,568	5,568	5,567	5,568	5,558
#Economic Activities	505	505	505	438	366
# Observations	4,370,217	4,370,216	4,370,214	4,370,149	4,190,747
R ²	0.0246	0.0347	0.0584	0.0828	0.1672

*** statistically significant at 1%. Robust standard error in parentheses.

The unconditional gender revenue gap coefficient in column 1 is around 0.311, indicating that female microentrepreneurs have, on average, 31.1% lower revenues than men. Specification 2 adds entrepreneur age and firm age as controls, while specification 3 adds municipality fixed effects, but they have no significant changes in the female coefficient, which remains at around 31%.

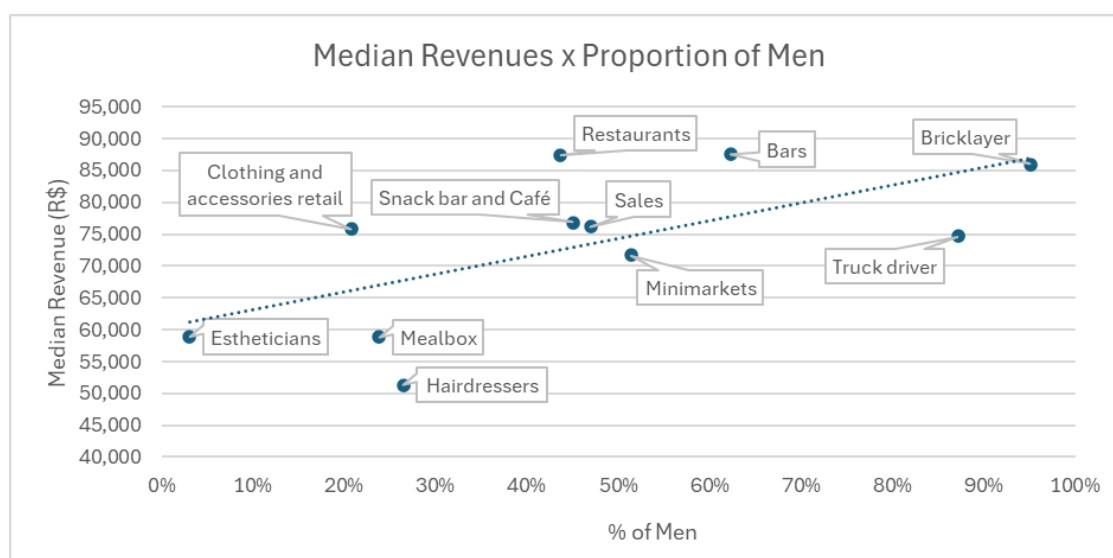
However, the last two models suggest that incorporating economic activity fixed effects, either alone or interacted with municipalities, reduces the average revenue gender gap by approximately 8 percentage points. In other words, when controlling for Economic Activity, the female coefficients drop to around 23%, implying that economic activity accounts for about one-quarter of the original revenue gap.

This may be explained by occupational segmentation, where there is a tendency for workers to concentrate in specific sectors. Men and women tend to cluster in different industries. To illustrate this point, data on predominantly female and male sectors were identified to compare their median revenues. The results highlight that the female-dominated sectors tend to have lower earnings.

Graph I plots, for the main economic activities of our sample, the proportion of men (horizontal axis) against median revenue (vertical axis). From this graph, we can observe that Economic Activities with a higher proportion of men tend to have higher median revenues.

Proportionally, the sector with the highest share of women was "Esthetician activities and other beauty care services," with 96.9% female participation and a median annual revenue of R\$ 58.5k. In contrast, "Masonry contractors" had the highest male participation at 95.1%, with a median annual revenue of R\$ 86k, a significantly higher amount.

Graph I



Regressions from Table II are not controlling for two important variables: the (formal) educational level and the quantity of hours worked by entrepreneurs. Accounting for education would likely amplify the gender gap, given that women generally possess a higher level of education, while considering the hours worked is likely to narrow the gap, as men typically have greater work hours.

Regarding workload, according to a study by Sebrae-MG (2024) on parenting and entrepreneurship, the difference between hours dedicated to business between men and women is less than 10%. Calculations using PNAD for self-employed professionals suggest men work about 11% more than women in the business.⁶ Therefore, accounting for workload would partially explain the gender gaps estimated in Table II, but it is unlikely to fully explain it.

Regarding educational level, we can control it only for a subsample of entrepreneurs who had previously had a formal job. For these individuals, we observe the formal educational level coming from the employer-employee dataset (RAIS). Considering this subsample (around 1.25 M observations), the gender coefficient would be -0,183 using the same specification of column (5), Table II. Adding educational level as a control variable widens the gap by about 1.6 percentage points. Therefore, education is indeed an important variable when analyzing the gender gap.

b. Extra income: Being an entrepreneur and a formal employee at same time

The results of the previous section are based on individuals who are exclusively microentrepreneurs. In this section, we analyze individuals who have a formal job, but at the same time engage in microentrepreneurial activities, probably to get an extra income. We estimate the same econometric specifications as in Table II, but with a sample composed of individuals with both formal jobs and entrepreneurial activity.

The results are in Table III. The unconditional revenue gender gap is 7.1%, thus substantially lower than Table II. Adding as controls Entrepreneur and firm Age and municipality fixed effects slightly widen the gender gap. Controlling for economic activity substantially reduces the gender gap, from around 8% to 5%. This is in line with the previous section's results.

⁶ The PNAD (National Household Sample Survey) is a survey conducted by IBGE (Brazilian Institute of Geography and Statistics) that aims to monitor quarterly fluctuations in the labor force and other information. The 11% estimate was calculated by comparing the average number of hours usually worked per week in all jobs between the two genders.

Table III – Microentrepreneur Revenue as an Extra Income

Dependent Variable: Log(Revenue)					
	(1)	(2)	(3)	(4)	(5)
Female	-0.071*** (0.0020)	-0.080*** (0.0020)	-0.083*** (0.0020)	-0.051*** (0.0023)	-0.052*** (0.0026)
Entrepreneur Age		0.004*** (0.0001)	0.004*** (0.0001)	0.004*** (0.0001)	0.004*** (0.0001)
Firm Age		0.024*** (0.0004)	0.024*** (0.0004)	0.022*** (0.0004)	0.025*** (0.0005)
Fixed Effects					
Economic Activity	No	No	No	Yes	N/A
Municipality	No	No	Yes	No	N/A
Munic. x Econ. Act.	No	No	No	No	Yes
# Municipalities	5,557	5,557	5,523	5,557	4,805
#Economic Activities	420	420	420	377	339
# Observations	922,700	922,700	922,666	922,657	815,717
R ²	0.0014	0.0089	0.0276	0.0434	0.1585

*** statistically significant at 1%. Robust standard error in parentheses.

c. Entrepreneurs with previous formal jobs

In this section, we analyze whether having a formal job in the past 5 years affects the firm's revenue and the gender gap. We use the same sample from Table II (thus we exclude those individuals who currently have a job) but we add variables related to their previous experience in the formal job market.

The first variable analyzed is a dummy variable equal to one if the microentrepreneur had a formal job in the last 5 years, i.e., from 2018 to 2022. These individuals represent 28% of the sample. The econometric specification is the same from column 5 of Table II, i.e., including control variables and municipality x economic activity fixed effects. Column 1 from Table IV show the results for "previous formal job" variable, while column 2 adds also the interaction with gender dummy.

The coefficient for the "previous formal job" dummy in column 1 indicates that entrepreneurs with previous formal job experience have lower revenues (-2,4%), on average. However, coefficients of column 2 show that this is the case only for male

entrepreneurs (-5,9%). For women, the sum of the “previous formal job” and “female x previous formal job” coefficients yield a positive number, meaning that firms belonging to women with previous formal job experience have higher revenues (+1,7%). Moreover, the gender gap for those with previous experience is 7.6% percentage points lower, i.e., the gender gap is 17.8%.

We further investigate previous formal job experience by differentiating those employees who were fired by the employer (22.6% of the sample) from those employees who voluntarily asked to quit the job (9.3% of the sample)⁷. Those who were fired might have been compelled to start a business to earn a living, suggesting that entrepreneurship was not their primary choice. Conversely, individuals who voluntarily quit a job to pursue business ventures likely made an intentional decision to engage in entrepreneurship, motivated by personal desires such as enjoying autonomy and not having a boss.

For the “fired” dummy, column 3 shows an overall 1.2% higher revenue than those with no previous recent formal job. However, column 4 shows that again we have gender heterogeneity: while men that were fired have revenues 1.9% lower, women previously fired have revenues 5.2% higher. Moreover, the gender gap for those previously fired is 7.1% percentage points lower.

For the “quit job” dummy, column 3 shows an overall 10.9% lower revenue than those with no recent formal job. While men who quit the job have revenues 14.3% lower, women who previously asked to quit have revenues around 7.2% lower. The gender gap for this subsample is similar to the previously fired sample (around 7%).

There is a third possibility where employer and employee consensually agree to terminate the job contract (0.6% of our sample). This is a recent option that was made possible after the 2017 labor legislation reform (Law 13.467/17). It is interesting to note that these entrepreneurs have the highest income, and that the gender gap is only slightly lower than those without previous experience in formal jobs.

⁷ There are individuals that were fired and also quit the job during the 5 previous year. In this case, they have both dummies equal to one.

Table IV – Entrepreneurs with Previous Formal Jobs

Dependent Variable: Log(Revenue)				
	(1)	(2)	(3)	(4)
Female	-0.233*** (0.0012)	-0.254*** (0.0014)	-0.231*** (0.0012)	-0.254*** (0.0014)
Previous formal job	-0.024*** (0.0011)	-0.059*** (0.0015)		
Female x Previous formal job		0.076*** (0.0021)		
Fired			0.012*** (0.0012)	-0.019*** (0.0015)
Female x Fired				0.071*** (0.0022)
Quit Job			-0.109*** (0.0016)	-0.143*** (0.0022)
Female x Quit Job				0.072*** (0.0031)
Consensual Quit			0.046*** (0.0056)	0.038*** (0.0073)
Female x Consensual Quit				0.021* (0.0112)
Fixed Effects				
Munic. x Econ. Act.	Yes	Yes	Yes	Yes
# Municipalities	5,540	5,540	5,540	5,540
#Economic Activities	366	366	366	366
# Observations	4,190,747	4,190,747	4,190,747	4,190,747
R ²	0.1673	0.1676	0.1681	0.1685

*** statistically significant at 1%. Robust standard error in parentheses.

In general, this section finds that the gender gap is lower for those with previous formal job experience, regardless of whether the employee was fired or asked to quit the job. A previous experience may narrow the skills gap between men and women and thus reduce the gender gap. Moreover, entrepreneurs who voluntarily quit their job have lower

revenues than those who were fired and those with no previous experience. This voluntary behavior may be an indication that those individuals value working without a boss, and may be willing to earn less to get rid of a boss. Further qualitative research is needed to clarify this point.

d. Formal Wages

In the second dataset, we analyze the gender gap in the formal job market, also in 2023, in order to compare it with the entrepreneurs' revenue gap. We perform five linear regression models, using the logarithmic wage as a dependent variable. The specifications try to mimic those of Table II, using similar variables in the formal job market. Results are in Table V.

The unconditional regression in the first column shows that women earn, on average, 9.6% less than men in the formal labor market. This is less than 1/3 of the gender gap for microentrepreneurs revenue found in Table II. When adding employer age and job tenure⁸, the wage gap increases to approximately 10.5%, still much lower than in Table II.

Specification in column (3) adds municipality fixed effects, widening the gender wage gap to 11.6%. Thus, the effect of location in the formal job market is stronger than in the entrepreneurship dataset. In the fourth regression, the inclusion of occupation fixed effects generates a wage gap of 10.9%. Therefore, unlike the economic activity of the microfirms, the job occupation has little explanatory effect in the gender wage difference. When using fixed effects of the interaction of occupation with economic activity, the wage gender gap is 11.1%, which is still much lower than the 23% of column 5 of Table II. However, when comparing formal employment with microentrepreneurship, caution is necessary because formal job wages are standardized by workload, whereas the income of microentrepreneurs is not.

We also add fixed effects for variables that are not available in the microentrepreneurs' dataset: formal education, race and the employer's economic activity classification⁹. The results are in column 6, and the gender wage gap drops to 10%.

⁸ The job tenure would be the counterparty of firm age of Table II.

⁹ While education pushes the gender gap to be wider, the economic activity of the employer goes in the opposite direction. Adding race as a control has no meaningful impact on the gender gap.

Table V – Wage Differential Regressions

	Dependent Variable: Log(Formal Wage)					
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.096*** (0.0002)	-0.105*** (0.0001)	-0.116*** (0.0001)	-0.109*** (0.0002)	-0.111*** (0.0001)	-0.100*** (0.0001)
Employee Age		0.008*** (0.0000)	0.008*** (0.0000)	0.007*** (0.0000)	0.006*** (0.0000)	0.005*** (0.0000)
Job Tenure		0.003*** (0.0000)	0.003*** (0.0000)	0.003*** (0.0000)	0.003*** (0.0000)	0.002*** (0.0000)
Fixed Effects						
Municipality	No	No	Yes	No	N/A	N/A
Occupation	No	No	No	Yes	N/A	N/A
Munic x Occup.	No	No	No	No	Yes	Yes
Others	No	No	No	No	No	Yes
# Occupation	194	194	194	194	194	194
# Observations	73,610,656	73,484,595	73,484,595	73,484,595	73,383,567	73,383,564
R ²	0.0047	0.2008	0.2434	0.4649	0.5395	0.6186

*** statistically significant at 1%. Robust standard error in parentheses.

6) Final Remarks

This study identifies a gender income gap between men and women not only on the formal job market, but also among entrepreneurs. For microentrepreneurs, our estimation indicates that women's revenue is about 31% less than men's. When controlling for economic activity, this difference drops to around 23%. In the formal job market, the gender wage gap is considerably lower, around 10%.

A limitation of this study is the lack of information on hours worked in business activities. Women's presence in the labor market is profoundly impacted by family context and the roles they assume within their families. Thus, although women have taken on greater economic responsibilities in recent decades, work in what is known as the care economy¹⁰—such as domestic work and caregiving for children and the elderly—is still predominantly performed by them. Therefore, it is possible that part of the revenue

¹⁰ See Stampini et al.(2020).

differential may be explained by the greater number of hours worked by men, as women may be more occupied with care economy tasks compared to men. However, it is unlikely that the gender gap estimated in this paper could be totally explained by the lower number of hours worked by women.

7) References

ALIBHAI, Salman; BUEHREN, Niklas; PAPINENI, Sreelakshmi; PIEROTTI, Rachael. Crossovers--Female Entrepreneurs Who Enter Male Sectors: Evidence from Ethiopia. World Bank Policy Research Working Paper No. 8065, 2017.

ARELLANO-BOVER, Jaime; BIANCHI, Nicola; LATTANZIO, Salvatore; PARADISI, Matteo. One cohort at a time: A new perspective on the declining gender pay gap. National Bureau of Economic Research, 2024.

BARDASI, Elena; SABARWAL, Shwetlena; TERRELL, Katherine. How do female entrepreneurs perform? Evidence from three developing regions. Small Business Economics, v. 37, p. 417-441, 2011.

BATISTA, Catia; SEQUEIRA, Sandra; VICENTE, Pedro C. Closing the gender profit gap?. Management Science, v. 68, n. 12, p. 8553-8567, 2022.

BERNHARDT, Arielle; FIELD, Erica; PANDE, Rohini; RIGOL, Natalia. Household matters: Revisiting the returns to capital among female microentrepreneurs. American Economic Review: Insights, v. 1, n. 2, p. 141-160, 2019.

BLAU, Francine D.; KAHN, Lawrence M. The gender wage gap: Extent, trends, and explanations. Journal of Economic Literature, v. 55, n. 3, p. 789-865, 2017.

BRIXIOVÁ, Zuzana; KANGOYE, Thierry. Gender and constraints to entrepreneurship in Africa: New evidence from Swaziland. Journal of Business Venturing Insights, v. 5, p. 1-8, 2016.

CAMPOS, Francisco. Gender Gaps at the Enterprise Level: Evidence from South Africa. The World Bank Africa region gender practice policy brief n. 1, 2011.

CAMPOS, Francisco; GASSIER, Marine. Gender and enterprise development in Sub-Saharan Africa: a review of constraints and effective interventions. World Bank Policy Research Working Paper Series, n. 8239, 2017.

CAVALCANTI, Tiago; FERNANDES, Leticia; RACHTER, Laísa; SANTOS, Cezar. Women and men at work: Fertility, occupational choice and development. IDB Discussion paper n. 961, 2022.

CHAUDHURI, Kausik; SASIDHARAN, Subash; RAJ, Rajesh Seethamma Natarajan. Gender, small firm ownership, and credit access: some insights from India. *Small Business Economics*, v. 54, n. 4, p. 1165-1181, 2020.

DANIELS, Lisa; MEAD, Donald C. The contribution of small enterprises to household and national income in Kenya. *Economic development and cultural change*, v. 47, n. 1, p. 45-71, 1998.

DANIELS, Lisa. The role of small enterprises in the household and national economy in Kenya: a significant contribution or a last resort?. *World Development*, v. 27, n. 1, p. 55-65, 1999.

DE MEL, Suresh; MCKENZIE, David; WOODRUFF, Christopher. Are women more credit constrained? Experimental evidence on gender and microenterprise returns. *American Economic Journal: Applied Economics*, v. 1, n. 3, p. 1-32, 2009.

EL-HAMIDI, Fatma. How do women entrepreneurs perform? Empirical evidence from Egypt. In: *Economic Research Forum (ERF) Working Paper*. 2011.

FARRELL, Diana; WHEAT, Chris; MAC, Chi. Gender, age, and small business financial outcomes. Available at SSRN 3355526, 2019.

GHAREHGOZLI, Orkideh; ATAL, Vidya. Revisiting the gender wage gap in the United States. *Economic Analysis and Policy*, v. 66, p. 207-216, 2020.

HARDY, Morgan; KAGY, Gisella. Mind the (profit) gap: why are female enterprise owners earning less than men?. In: *AEA Papers and Proceedings*. 2014 Broadway, Suite 305, Nashville, TN 37203: American Economic Association, 2018. p. 252-255.

IBGE – Instituto Brasileiro de Geografia e Estatística. **Estatísticas de Gênero:** indicadores sociais das mulheres no Brasil. Rio de Janeiro: IBGE, 2024. Available at: https://biblioteca.ibge.gov.br/visualizacao/livros/liv102066_informativo.pdf. Access in: 05 aug. 2024.

MCKENZIE, David; WOODRUFF, Christopher. Business practices in small firms in developing countries. *Management Science*, v. 63, n. 9, p. 2967-2981, 2017.

MCPHERSON, Michael A. Growth of micro and small enterprises in southern Africa. *Journal of Development Economics*, v. 48, n. 2, p. 253-277, 1996.

NIX, Emily; GAMBERONI, Elisa; HEATH, Rachel. Bridging the gender gap: Identifying what is holding self-employed women back in Ghana, Rwanda, Tanzania, and the Republic of Congo. *The World Bank Economic Review*, v. 30, n. 3, p. 501-521, 2016.

NORDMAN, Christophe; VAILLANT, Julia. Inputs, gender roles or sharing norms? Assessing the gender performance gap among informal entrepreneurs in Madagascar. Working Papers DT/2013/15, DIAL - Développement, Institutions et Mondialisation, 2013.

O'REILLY, Jacqueline; SMITH, Mark; DEAKIN, Simon; BURCHELL, Brendan. Equal pay as a moving target: International perspectives on forty-years of addressing the gender pay gap. *Cambridge Journal of Economics*, v. 39, n. 2, p. 299-317, 2015.

RIJKERS, Bob; COSTA, Rita. Gender and rural non-farm entrepreneurship. *World Development*, v. 40, n. 12, p. 2411-2426, 2012.

Sebrae – Serviço Brasileiro de Apoio às Micro e Pequenas Empresas. Relacionamento Bancário do MEI: Pesquisa com Microempreendedores Individuais (MEIs) de Minas Gerais. Minas Gerais: Sebrae, 2024a. Available at: https://www.inteligencia-sebraemg.com.br/_files/ugd/d0f56d_2fbc637a00ed446386a33aeaff244b77.pdf Access in: 03. jul. 2024.

Sebrae – Serviço Brasileiro de Apoio às Micro e Pequenas Empresas. Parentalidade e Empreendedorismo. Minas Gerais: Sebrae, 2024b. Available at: https://www.inteligencia-sebraemg.com.br/_files/ugd/d0f56d_0f84c4ed895b48f9acdaca0ea3536cfd.pdf Access in: 16. oct. 2024.

Sebrae – Serviço Brasileiro de Apoio às Micro e Pequenas Empresas. Pesquisa Mulheres Empreendedoras. Minas Gerais: Sebrae, 2024c. Available at: https://www.inteligencia-sebraemg.com.br/_files/ugd/d0f56d_59f460428c3646baa98bd66db5a2890b.pdf Access in: 16. oct. 2024.

SLOANE, Carolyn M.; HURST, Erik G.; BLACK, Dan A. College majors, occupations, and the gender wage gap. *Journal of Economic Perspectives*, v. 35, n. 4, p. 223-248, 2021.

STAMPINI, Marco; OLIVERI, Maria Laura; IBARRARÁN, Pablo; LONDOÑO, Diana; RHEE, Ho June (Sean); JAMES, Gillinda M. Working less to take care of parents? Labor market effects of family long-term care in four Latin American countries. IZA Discussion Papers, 2020.

TENOURY, Gabriel Nemer Cavalcanti da Silva; MADALOZZO, Regina Carla; MARTINS, Sergio Ricardo. Diferença salarial e taxa de participação no mercado de trabalho brasileiro: uma análise a partir do sexo dos indivíduos. Estudos Econômicos (São Paulo), v. 51, p. 33-72, 2021.

TERRELL, Katherine.; SABARWAL, Shwetlena. Does Gender Matter for Firm Performance?. Evidence from Eastern Europe and Central Asia Policy Research Working Paper, v. 4705, 2008.

WEICHSELBAUMER, Doris; WINTER-EBMER, Rudolf. A meta-analysis of the international gender wage gap. Journal of economic surveys, v. 19, n. 3, p. 479-511, 2005.

World Bank. **World development indicators**. 2024. Available at: <https://databank.worldbank.org/source/world-development-indicators#>. Access in: 05 aug. 2024.