

UNIVERSIDAD SAN FRANCISCO DE QUITO USFQ

Colegio de Economía

**Gender gap in labor market transitions in Ecuador from
2003 to 2022**

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Economía

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UNIVERSIDAD SAN FRANCISCO DE QUITO USFQ
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HOJA DE CALIFICACIÓN DE TRABAJO DE FIN DE CARRERA

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Quito, 09 de mayo de 2024

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A mí.

RESUMEN

Este estudio examina la brecha de género en las transiciones del mercado laboral de Ecuador durante las últimas dos décadas. Empleando una metodología de descomposición Blinder-Oaxaca, exploro la diferencia en las probabilidades de transición entre hombres y mujeres, mientras también disecciono la disparidad de género en componentes explicados e inexplicados. El artículo se centra en la dinámica entre la situación laboral formal e informal de asalariados, trabajadores por cuenta propia y desempleados. Los resultados muestran que los hombres exhiben una mayor movilidad en el mercado que las mujeres, particularmente en las transiciones de empleo formal e informal, mientras que las mujeres tienen más probabilidades de migrar al desempleo. En general, la evidencia sugiere una posible presencia de discriminación contra las mujeres en las transiciones del mercado laboral en Ecuador, demostrado por la magnitud del componente no explicado. Sin embargo, esta no es una conclusión definitiva, ya que existen otros factores no medibles que pueden contribuir a la brecha inexplicable, que no necesariamente denotan un sesgo de género.

Palabras clave: Brecha de género, Mercado laboral, Empleo informal, Ecuador

ABSTRACT

This study examines the gender gap in Ecuador's labor market transitions over the past two decades. Employing a Blinder-Oaxaca decomposition methodology, I explore the difference in transition probabilities between men and women, while also dissecting the gender disparity into explained and unexplained components. The paper focuses on the dynamics between formal and informal employment status of wage earners, self-employed individuals and the unemployed. Findings show that men exhibit more market mobility than women, particularly in formal and informal employment transitions, whereas women are more likely to migrate to unemployment. Overall, evidence suggests possible presence of discrimination against women in labor market transitions in Ecuador, demonstrated by the magnitude of the unexplained component. However, this is not a definitive conclusion, as there are other non-measurable factors that can contribute to the unexplained gap, which may not necessarily denote gender bias.

Keywords: Gender gap, Labor market, Informal Employment, Ecuador

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1 Introduction

The fluidity with which employees can transition from one employment status to another serves as a strong indicator of the flexibility of the labor market, as well as the effectiveness of labor regulations, particularly the ones that aim to reduce unemployment and informal employment. Following a 20% fall, informality rates in Ecuador have grown rapidly since 2015, exhibiting current levels of 68% of informal employment. Gender displays an intriguing dynamic, as a gap between men and women is identifiable, showing that the percentage of men participating in the informal labor market has been up to 15 points higher than that of women. Despite this, the disparity has unfolded in various proportions across time. In this paper, I look at the evolution of gender gap in labor market transitions in Ecuador in the last 20 years.

In order to do analyze transitions between men and women, I use ENEMDU rotating panels from 2003 to 2022. With the identification of five employment status, a Markov matrix is constructed, comprising 25 transition probabilities. After rectifying sample selection bias via the Heckman correction model, Blinder-Oaxaca twofold decomposition is applied to labor market transitions. Besides measuring the gender disparity, this methodology also allows to dissect the gap into explained and unexplained components. In this way, it is possible to determine to which extent the difference is due to observable characteristics between genders, and how much is due to factors that cannot be measured.

Regarding labor classification, employment status is first divided by employment and unemployment. In turn, employment is categorized based on sector of the economy: formal and informal, with each being split into wage earners and self-employed, with a total of five employment status. Given the 2-2-2 rotation scheme employed by the Ecuadorian Employment Survey, each panel in this study spans two years, all of which analyze December waves. Employment status trends show that probabilities of remaining in the same employment situation are the highest, demonstrating the rigidity behind Ecuador's labor market.

Results evidence that men present more market mobility than women in most transitions, regarding both formal and informal employment. The largest gap is identified in the transition where individuals remain as informal wage earners, with men displaying, on average, a 20% higher likelihood of remaining in informality compared to women. This is explained through negative values observed in the difference coefficients between the probability of women in market transitions and that of men.

Women are more likely than men to migrate from any labor status to unemployment. These are the only transitions where the difference coefficients take positive values, even though magnitudes are relatively low, with disparities being below 5 percentage points. This latter finding can be attributed to the fact that, when exiting employment, women are more prone to resign, while men are more likely to be dismissed. Nonetheless, due to high costs of dismissals in Ecuador, employees are usually not discharged, but removed from payroll, thus migrating to informal employment.

Along with these results, I find that, on average, the explained gap is higher for women than for men in certain transitions. This could be substantiated by the fact that Ecuadorian women have more years of education than men. Most importantly, findings suggest a possible presence of discrimination against women in most labor market transitions. This is supported by the notion that in most transitions the unexplained component contributes to the majority of the difference. The prejudice against women in Ecuadorian labor market dynamics, however, is not conclusive, as there are other non-observable characteristics that are able to explain the gender gap besides discrimination.

1.1 Relation to Literature

The paper contributes to the recent literature that questions the effectiveness of Ecuadorian policies applied to the labor market and social protection, by analyzing market dynamics be-

tween formal and informal employment (Vega Núñez, 2017; Jara and Rattenhuber, 2022; Díaz-Sánchez and Correa, 2024; Arias Marín et al., 2020). I provide empirical evidence that goes further and examines the disparity between men and women in such dynamics. Moreover, this paper extends the period of analysis, as it compiles almost 20 years of study. To the best of my knowledge, this is the first study to evaluate gender disparities in labor market transitions in Ecuador.

More generally, I also contribute to the study of gender dynamics in Ecuador, as so far, it has focused mainly on gender pay gap (Bank, 2018; Songor-Jaramillo and Moreno-Hurtado, 2020; Linthon-Delgado and Méndez-Heras, 2022; Antón et al., 2020). Urquidi et al. (2023), as well as Benítez and Espinoza (2018), demonstrate that although women, on average, have a better work profile than men, their income level does not reflect it, suggesting the existence of gender biases. I add the examination of market transitions to the analysis regarding gender in Ecuador. My findings correlate with those evaluating gender pay gap, as they show that despite women having a higher explained gap than men, evidence suggests that there is possible evidence of discrimination.

My research relates to the literature that assesses the role of gender in market mobility (Khoudja and Fleischmann, 2018; De la Rica and Rebollo-Sanz, 2017; Baussola et al., 2015). While Petrongolo and Ronchi (2020) and Theodossiou and Zangelidis (2009) examine the evolution of female employment and transitions from and to unemployment, my study extends this analysis by including dynamics regarding formal and informal employment, as well as wage earners and self-employed. Considering the prevalence of informality within Ecuador's labor market, this analysis is much needed.

Finally, this paper relates to the literature that delves into the methodology and application of the Blinder-Oaxaca twofold decomposition (Oaxaca, 1973; Blinder, 1973; Kitagawa, 1955). Fairlie (2005), and more recently Rahimi and Hashemi Nazari (2021), provide a comprehensive explanation of the theoretical and practical approach of the Oaxaca decomposition. By building

upon this established framework, my study uses a quantitative approach to examine gender disparities in labor market transitions.

2 Background

2.1 Labor Regulations

The Ecuadorian labor market is characterized by its notable rigidity attributable to an inflexible legislation that inhibit employees from transitioning to a more favorable employment situation, which leads to workers staying in informal positions. This is evidenced in Djankov and Ramalho (2009), where the authors found that developing countries with high levels of rigidity in their labor markets tend to have large informal sectors. These circumstances contribute to an understanding of why Ecuador's unemployment rates are relatively low, while levels of informal employment are alarmingly elevated (Pérez and Hurtado, 2019).

The flexibility of a labor market is measured by the capacity of a firm to promptly and effectively adapt its workforce in response to changes in market conditions (e.g., an economic crisis). In order to achieve such flexibility, it is preferable to have minimal labor force regulations, as this makes it easier to hire new personnel. Additionally, the costs associated with layoffs and providing social security benefits to employees should be kept low to reduce informal labor practices. However, the labor market in Ecuador does not align with these principles.

Numerous statutes in Ecuadorian legislation make it difficult for supply and demand to meet in the labor market by limiting firms' actions concerning the recruitment and dismissal of employees. In 2008, former Ecuadorian President, Rafael Correa, eliminated labor intermediation, outsourcing and hourly employment aiming to eradicate any form of "precariousness in employment relationships" (Asamblea Constituyente del Ecuador, 2008).

Williamson's Transaction Costs Theory explains the necessity for the labor outsourcing alternative to exist in the market, stating that activities can be internalized/externalized within a firm based on their transaction costs. If costs are too high, assigning the firm's own operations to external mechanisms helps to economize production processes (Greve and Argote, 2015; Arcos Naranjo, 2015). Outsourcing and intermediation procedures serve to stimulate labor markets by increasing job opportunities and firms' economic efficiency, which reverts to improvements for the workers themselves (Jara Jaramillo, 2012).

Continuing this line of reasoning, another argument why a rigid labor legislation can contribute to informal employment is because of mandated severance payments. The costs associated with dismissing an employee in Ecuador are relatively high. According to Ecuador's legislation, if an employee's dismissal is legally justified, such as due to dishonesty or fraud, there is no need for severance pay. However, if there is no justification, the employer is obligated to provide compensation equivalent to one month of remuneration for each year of service (Congreso Nacional, 2012). In the same way, when an employee resigns, the employer is legally mandated to pay a compensation of 25% of their last monthly salary for each year of service. The consequence of Ecuador's high mandated severance payments is that employers, when faced with the need to downsize, often opt to remove workers from payroll instead of a formal dismissal. Consequently, formal wage earners transition into informal employment.

Similarly, Ecuador's labor force is subject to many monetary employment benefits, thus, constraining employers from engaging in legal hiring practices due to high costs. Besides the standard twelve monthly payments, individuals employed under a dependency relationship in Ecuador are entitled to receive a thirteenth and fourteenth salary (*décimo tercero y décimo cuarto*). The thirteenth salary is a Christmas bonus which is equivalent to a monthly wage. Whereas the fourteenth salary is a scholar bonus and typically aligns with Ecuador's minimum monthly wage.

Furthermore, social security affiliation entitles employees to additional benefits such as

maternity leave, paternity leave, maternity allowances, among others (Congreso Nacional, 2012). Analogous to high severance payments, these social benefits represent substantial costs for firms engaging in legal employment practices, which means that many workers will remain on informal employment. It is evident that a more flexible labor market would not only make it easier to hire new personnel at a reduced cost, but layoffs would also be more feasible. Nevertheless, as demonstrated by Kaplan (2009), dismissals resulting from non-rigid labor regulations are compensated with new hires, resulting in a net gain for formal employment.

2.2 Minimum Wage and Productivity

Behind high non-labor costs and Ecuador's inflexible labor market lies the complex matter of minimum wage. Most calculations for severance payments and social benefits are estimated based on the country's minimum wage (*Salario Básico Unificado* - SBU), currently set at \$460. However, due to legal benefits, the real costs of having a minimum wage employee average more than \$600 per month (Cevallos Macías and Villacís Blum, 2023). Minimum wage aims to prevent excessive poverty, guarantee a decent lifestyle and reduce inequalities among workers (Vera, 2012). Fundamental factors for any modification to minimum remuneration include inflation rates, living expenses, job competitiveness, and notably, productivity levels (Krugman, 2012). As Wong (2016) argues, minimum wage should be related to productivity. This is where Ecuador's labor market dilemma arises.

While the logic behind raising minimum wages, as postulated by the Efficiency Wages theory, suggests that it may be profitable for a firm to pay a higher compensation in order to enhance labor productivity (Mankiw and Rabasco, 2007), Ecuador's reality shows that this policy measure is not working. Figure 1 shows the dynamics between minimum wage and productivity from 2003 to 2022. It reveals that both factors have exhibited an increasing trend over the past 20 years. Initially, productivity levels were higher than Ecuador's minimum salary, which aligns with the concept that giving an incentive through wages increases labor productiv-

ity. However, circa 2014, this dynamic reversed and productivity levels started to grow slowly, failing to match the rapid escalation of the minimum wage.



Figure 1: **Minimum Wage vs. Productivity** This figure displays minimum wage and productivity trends, as well as dynamics in mean income for men and women from 2003 to 2022. All of these variables are transformed into natural logarithms and are normalized to the initial year. It also displays a vertical line in 2014, showing the change in dynamics, where minimum wage surpassed productivity levels. Productivity was estimated through GDP per person employed, using the new mobile base methodology of the Central Bank of Ecuador. The other variables were obtained from ENEMDU.

The unsustainable gap between minimum compensation and productivity has widened in recent years. The problematic arises from the fact that given that minimum wage cannot constitutionally be reduced and that changes in Ecuadorian productivity are slow, informal employment intervenes as an adjustment mechanism, where salaries are below minimum wage (Uribe et al., 2023). The situation of informality in Ecuador is arduous. Over 95% of businesses are categorized as Small And Midsize Enterprises (*Pequeñas y Medianas Empresas - PYMES*), more than 50% of them operate informally and employ less than 10 workers (Andrian et al., 2024).

Figure 2 shows Ecuador's evolution of percentage of informality since 2003. Informal employment has followed a pattern similar to a U-shaped trend. Starting with high levels that reached up to 75% of informal employment, followed by the lowest levels recorded within the

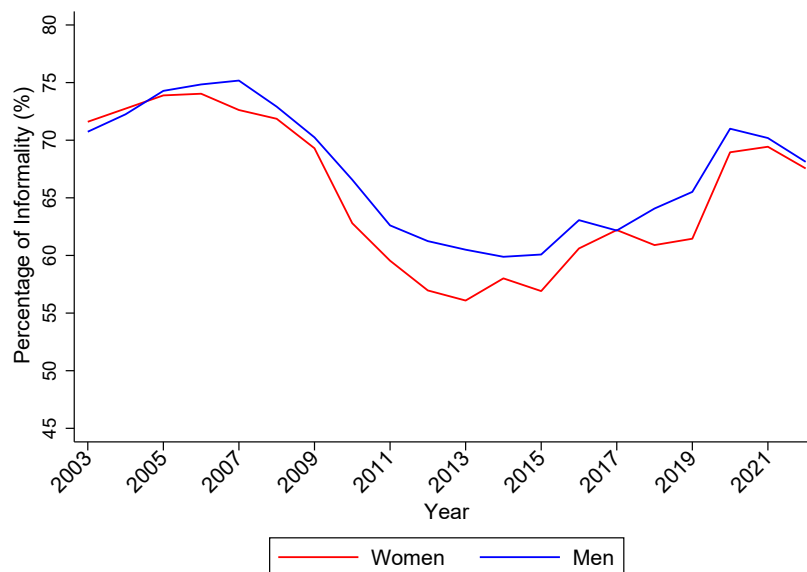


Figure 2: **Percentage of Informality.** This figure shows the evolution of the percentage of informality for men and women from 2003 to 2022. Informality is identified with individuals who do not contribute to the social security system. Data was sourced from ENEMDU.

analyzed period, informality in Ecuador has increased rapidly in the last few years, currently standing at approximately 68%. It is noteworthy that, although initially the percentage of informality was slightly higher for women, since 2004, a larger proportion of men participate in the informal labor market compared to women.

The breach between men and women became particularly broader after 2009. This gender dynamic can be partially explained with the formalization of domestic workers. Public programs and campaigns, such as "Decent Domestic Work" (*Trabajo Doméstico Digno*) in 2010, alongside organic laws aimed at safeguarding labor rights, diminished the number of informal domestic workers (Lexartza et al., 2016). Therefore, the gender gap increased. Particularly, the percentage of men participating in the informal labor market in 2013 was more than 15 points higher than that of women. However, in recent years informality levels for men and women seem to be converging to similar proportions.

3 Methodology

In order to analyze labor market transitions, a Markov chain is identified, given the discrete nature of time and that of the variable of interest, labor status. This method provides distinct advantages to the market mobility analysis, as it enables the modeling of a stochastic process. Moreover, this model accurately measures market transitions in order to predict future changes in employment situation (Lipták et al., 2011).

Employment status comprises five dichotomous variables describing employment states for the economically active population at distinct points in time: formal wage earner, formal self-employed, informal wage earner, informal self-employed and unemployed. It is pertinent to mention that this variable is not only categorical, but also ordered. Adhering to the principles of the Markov chain, it is possible to calculate transition probabilities in the labor market as follows:

$$p_{xy} = P(\bar{X}_t = S_y | \bar{X}_{t-1} = S_x), \quad (1)$$

where p_{xy} is the conditional probability of the individual being in state S_y given that they were in state S_x the previous year. With all transition probabilities corresponding to each state, a Markov matrix can be assembled, taking on the following form:

$$P = \begin{bmatrix} p_{11} & \cdots & p_{1n} \\ \vdots & \ddots & \vdots \\ p_{n1} & \cdots & p_{nn} \end{bmatrix}. \quad (2)$$

Consider there are n states in this example. This means that the initial component of the transition probability matrix, p_{11} , denotes the probability of remaining in state 1 across consecutive time periods. By extending this logic, each element within the first row of this matrix indicates the probability of being in state $[1;n]$ given that the individual was in state 1 the previous period

of time.

To proceed with estimation, it is necessary to examine if there is any evidence of sample selection bias. Selection bias occurs when the sample is partially or non-randomly chosen, leading to an inaccurate representation of the population and thereby compromising both, internal and external validity. This discrepancy is due to individuals differing in important aspects even before applying any intervention (Berger, 2007). In this model, the potential for sample selection bias arises from the fact that, initially, the analysis was focused on individuals within the economically active population. This selection excluded individuals who are outside of the labor market. Consequently, this bias resulted in a lower proportion of informality being observed.

The Heckman model serves as a valuable instrument for fixing said bias, by correcting standard errors (Certo et al., 2016). The Heckman correction is conducted through an ordered probit regression, incorporating variables pertaining to all individuals within the sample, both those who are part of the labor market and those who are not:

$$y_n^* = \beta_0 + \beta_1 gender + \beta_2 age + \beta_3 age^2 + \beta_4 educ + \beta_5 ethnicity + \varepsilon_n, \quad (3)$$

with y_n^* being an unobserved variable that responds to the ordinal status variable Y_n , employment status, which includes the following observable response categories:

$$Y_n = \begin{cases} 1 & \text{(Formal wage earner)} \\ 2 & \text{(Formal self-employed)} \\ 3 & \text{(Informal wage earner)} \\ 4 & \text{(Informal self-employed)} \\ 5 & \text{(Unemployed)} \end{cases} \quad (4)$$

After predicting y_n^* through the ordered probit regression, the inverse Mills ratio variable

is calculated using a two-stage estimation procedure, by dividing the density of the normal distribution and the cumulative distribution function at those points. This new variable denoted by the symbol λ is applied to every observation that did not register an employment status (i.e., every person who is not part of the economically active population). By including the inverse Mills ratio in any posterior regression, sample selection bias is corrected.

In order to identify the existence of a gender gap in labor market transitions, the Blender-Oaxaca decomposition is identified, as this method not only confirms a disparity between groups, but it also describes the sources of said disparity.

After rectifying the sample selection bias using Heckman correction, the Blender-Oaxaca decomposition method is employed to assess the explained and unexplained gap (Rahimi and Hashemi Nazari, 2021; Fairlie, 2005). The two-fold decomposition technique measures the extent to which differences in mean outcomes between two groups derive from between-group differences in the explanatory variables ("explained" component) and how much is due to group differences in unobserved characteristics ("unexplained" component).

In simpler words, the explained component interprets the gender gap through observable attributes and capabilities of each individual (e.g., years of education or branch of activity), whereas the unexplained component interprets the gap through unseen elements, that is, the portion of the gap that cannot be attributed to observable factors. This effect is often referred to as the "discrimination" effect, however, it is important to emphasize that it can also indicate the impact of characteristics that cannot be measured.

This is better exemplified with the following expression:

$$\bar{Y}_1 - \bar{Y}_2 = \sum_{j=1}^k \beta_j^1 (\bar{x}_j^1 - \bar{x}_j^2) + \sum_{j=1}^k \bar{x}_j^2 (\beta_j^1 - \beta_j^2). \quad (5)$$

Here we have the two components, $\beta_j^1 (\bar{x}_j^1 - \bar{x}_j^2)$ being the explained component and $\bar{x}_j^2 (\beta_j^1 - \beta_j^2)$ the unexplained component. In the case of this study, \bar{Y}_1 refers to the mean outcome for women

and \bar{Y}_2 refers to the mean outcome for men.

In order to determine the gender gap labor market transitions, each transition is assigned an Oaxaca decomposition for all panels, which adds up to a total of 225 regressions. Because the sample selection bias has already been corrected, this regression includes variables pertaining only individuals who are part of the economically active population and the inverse Mills ratio. The model used to measure these effects can be written as:

$$\Delta\bar{Y}_{xy} = \sum_{j=1}^9 \beta_j^1(\Delta\bar{X}_j) + \sum_{j=1}^9 \bar{X}_j^2(\Delta\bar{\beta}_j), \quad (6)$$

where $\Delta\bar{Y}_{xy}$ refers to difference coefficient in mean outcome between women and men who transitioned from state S_x to state S_y , taking into account that the base group (group 1) are women.

The model includes the same independent variables from Equation 3, plus hours worked per week, branch of activity, relationship with the head of household, labor income and λ , the inverse Mills ratio variable. The model is modified for transitions from unemployment to other labor statuses, as the variance of variables regarding employment, such as hours worked per week, branch of activity and labor income, is zero. These 3 variables were not included for the model of transitions from unemployment. Also important to note, because of the nature of panel data, all controls are lagged one period, in this case, one year.

4 Data

The dataset used for this present study is constructed using information extracted from Ecuador's publicly available National Survey of Employment, Unemployment, and Underemployment (*Encuesta Nacional de Empleo, Desempleo y Subempleo - ENEMDU*). A data harmonization

process was conducted in order to compare variables and data across the analyzed period.¹

Ecuador uses a 2-2-2 rotation scheme, recommended by the International Labour Organization for quarterly employment surveys. This methodology involves maintaining a panel of selected clusters within the sample for two consecutive quarters, followed by a break of two quarters, before reintroducing them into the sample for two final quarters (i.e., precisely twelve months later) (Granda et al., 2019). An example of panel rotation for period 2021-2022 is depicted in Table 1.

Mar-2021	Jun-2021	Sept-2021	Dec-2021	Mar-2022	Jun-2022	Sept-2022	Dec-2022
A	A	B	B	A	A	B	B

Table 1: **ENEMDU Panel Rotation** This table shows how the 2-2-2 rotation scheme functions. This example utilizes December waves from period 2021-2022. It is influenced by the panel rotation table showed in ENEMDU's Methodological Document for Labor Transition Matrix (*Matriz de Transición Laboral - Documento Metodológico*).

My dataset spans from 2003 to 2022, as ENEMDU started using the described method in 2003, with the exception of years 2017 and 2020. The former because of a change in methodology (which reverted the following year) and the latter because of the pandemic. Given that each panel spans two years, this study compiles 9 panels in total, all of which analyze December waves.

The particular variables extracted from the survey and used in this study include formality, income as wage earner, self-employment income, condition of activity, education level, branch of activity, hours worked per week, relationship with the head of household, ethnicity, gender and age. Initially, the dataset only included numeric expressions as labor income values. However, ENEMDU's methodology changed in 2016 and labor income for unemployed individuals was modified from 0 to missing values. Also important to note, this investigation focuses on individuals over the age of 18 and under 65 years old residing in urban areas.

The formality variable defines the sector of the economy to which Ecuadorians belong:

¹Tabulates and historical series, forms, methodology and additional information about ENEMDU's database are available in INEC's Open Data Bank: <https://aplicaciones3.ecuadorencifras.gob.ec/BIINEC-war/>

formal or informal. An individual is part of the formal economy if they contribute to social security. Wage earners determination is based on the presence of positive values in the income as wage earner variable, while self-employment is conversely assigned via the self-employment income variable. Finally, unemployed individuals are identified with the condition of activity variable, which includes the categories of open unemployment and hidden unemployment.² This variable takes zero values when labor income is greater than zero. The three labor categories are mutually exclusive, individuals cannot simultaneously belong to three categories.

4.1 Employment Status Trends

Before analyzing the gender gap in labor market transitions, it is fundamental to evaluate the historical trends that labor dynamics have shown in Ecuador over the past 20 years. I have identified five possible employment statuses: Formal Wage Earner (Formal WE), Formal Self-Employed (Formal SE), Informal Wage Earner (Informal WE), Informal Self-Employed (Informal SE) and Unemployed. Therefore, there are 25 market transitions, which are displayed in Figure 3.

Figure 3 depicts the probability of transitioning from one employment status to another over the course of a year. The main diagonal of the matrix exhibits the likelihood of remaining in the same employment situation, being these transitions the ones with the highest probabilities. This translates into the notion that Ecuadorians are more prone to remain in their labor status over time, confirming the rigidity behind Ecuador's labor market and that labor mobility is not feasible.

Certain labor market transitions exhibit disparity in their patterns between men and women, one of the most prominent being the probability of remaining as an informal wage earner, where

²According to ENEMDU, open unemployment refers to unemployed individuals who, in the reference week, were actively seeking employment. Whereas hidden unemployment concerns unemployed individuals who were not seeking employment in the reference week.

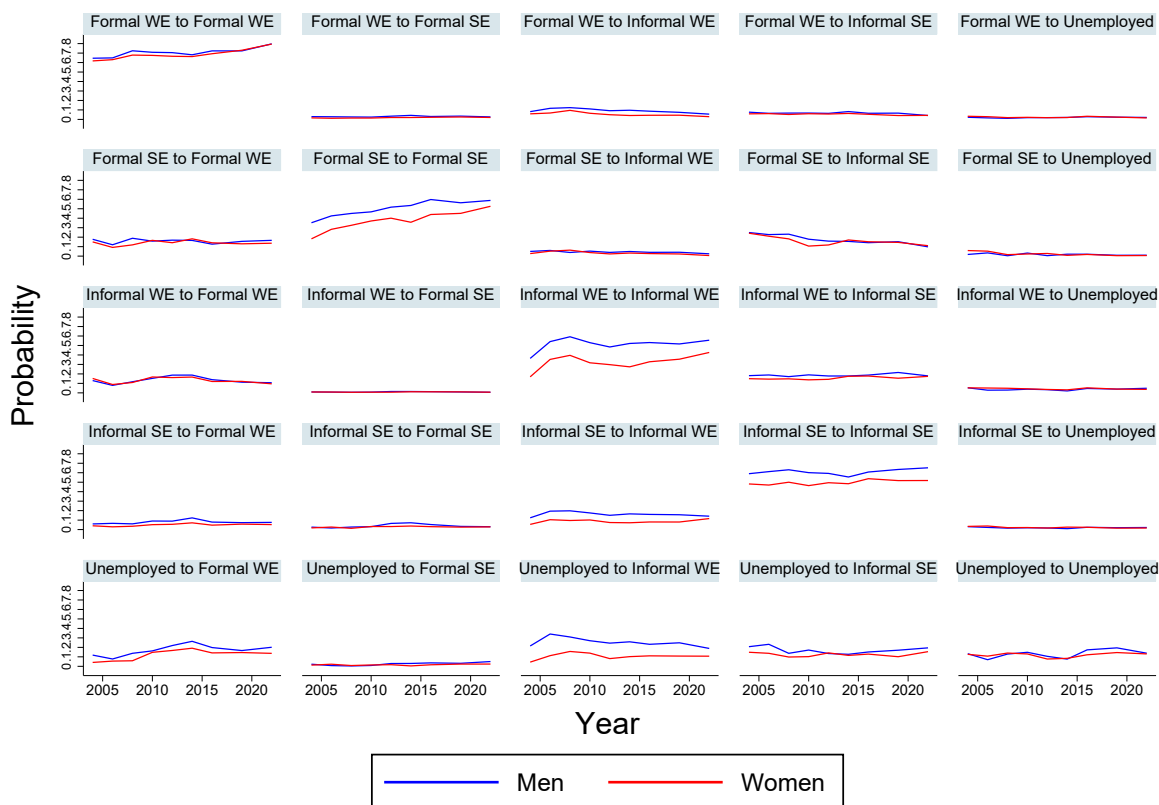


Figure 3: Labor Market Transitions This figure displays the 25 market transitions in the form of a matrix, for men and women. There are 5 employment situations: Formal Wage Earner (Formal WE), Formal Self-Employed (Formal SE), Informal Wage Earner (Informal WE), Informal Self-Employed (Informal SE) and Unemployed. The span of transition is one year. These transitions were calculated using the Markov matrix methodology. Data was sourced from EN-EMDU.

the likelihood is substantially higher for men than for women. Over the past 20 years, men have been, on average, 19% more likely to remain in informal employment compared to women. The gender gap peaked between 2013 and 2014, where the probability was 27% for women and 52% for men. Dynamics for both genders show similar trends, with an 18-point increase from 2004 to 2006. Nevertheless, while men's likelihood seems to maintain on constant levels, women's show a significant increment.

A similar pattern is reflected on the probability of remaining as a formal self-employed. The probability of this transition is also higher for men, although the disparity with women is lower. On average, men are 13% more prone to maintain formal self-employment than women. In the last 10 years, this breach between genders has diminished, with the difference being

approximately 6 percentage points. Furthermore, this transition has displayed an increasing tendency since the beginning of the period of analysis.

The probability of transitioning from unemployed to informal wage earner shows a similar pattern, not only in trend but also in gender disparity, to the transition of remaining as informal self-employed. Both transitions do not depict major changes in likelihood over the years, while also showing that probability for men is higher. The average gap stands at 15 percentage points for unemployed individuals who migrate to informal wage earners, whereas the average disparity for Ecuadorians remaining as informal self-employed exceeds 11 points.

Equally important to the analysis is the probability of remaining as a formal wage earner, and as unemployed. Both transitions show the gender breach is almost nonexistent, with an average difference of 2 percentage points for formal wage earners and just 1 point for the unemployed. Also important to note, women had a larger growth in likelihood than men as formal wage earners, with the last 2 panels showing virtually the same probabilities for both genders. While the formal wage earner transition evidences that this probability has had an increasing tendency over the past 2 decades, the unemployment transition exhibits that its likelihood in the first and last year of analysis remained the same for both men and women, despite some minor changes.

Most labor market transitions do not show significant disparities between men and women and are linked to low probabilities. Moreover, only two transitions depict a gap in favor of women: formal wage earner to unemployed, and formal self-employed to unemployed. Nonetheless, these breaches are almost nonexistent, with the former being 0.4% and the latter being 0.7%.

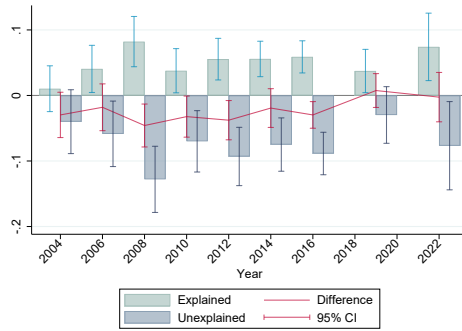
5 Results

This section delves into the findings of the present study regarding gender gap in labor market transitions in Ecuador. In order to represent these results, difference coefficients from the Blinder-Oaxaca twofold decomposition are graphed, alongside its explained and unexplained components with 95% confidence intervals for each transition over the past 2 decades. Results from pivotal transitions are shown in Figure 4. For the rest of results, please refer to Appendix A.

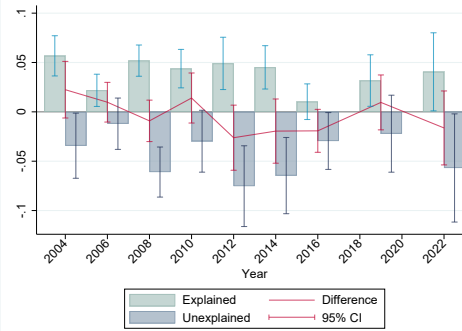
Findings indicate that men present greater market mobility compared to women across most transitions, both the ones who represent a shift to a more favorable labor status (Panel b, Figure 4), and those that imply a transition to a less favorable employment status (Panel h, Figure 4). These results align with the probabilities of labor market transitions depicted in Figure 3.

The dynamic of remaining as a formal wage earner is very intriguing (Panel a, Figure 4). Men are more likely to engage in this transition, as the difference takes mostly negative values and the base group are women. This difference, however, is only statistically significant for half of the panels, and its magnitude remains relatively small, averaging less than 5 percentage points. The unexplained component, which is significant in nearly every panel, is also negative and accounts the majority of the difference. This implies that if men and women had the same characteristics, men would still be more likely to remain as a formal wage earner in the Ecuadorian labor market.

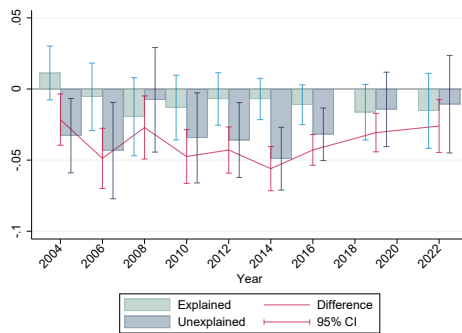
Although this effect is caused by unseen components, it could be argued that it is evidence of discrimination against women. The reason why this likelihood is not higher in favor of men is because observable characteristics are higher for women in every year. To get a better sense of the magnitude of the effect, note that in 2008 the unexplained component was diluted by



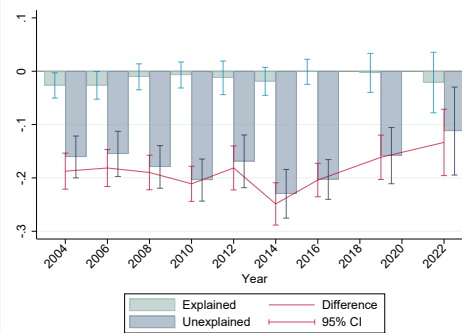
(a) Formal WE to Formal WE



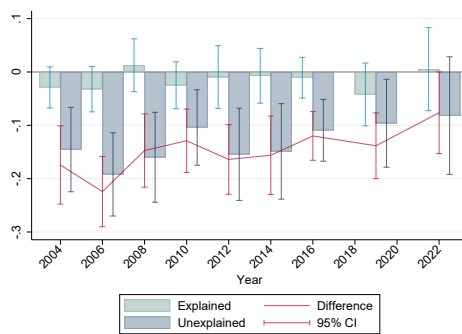
(b) Informal WE to Formal WE



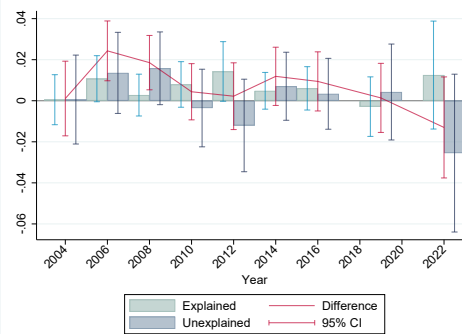
(c) Formal WE to Informal WE



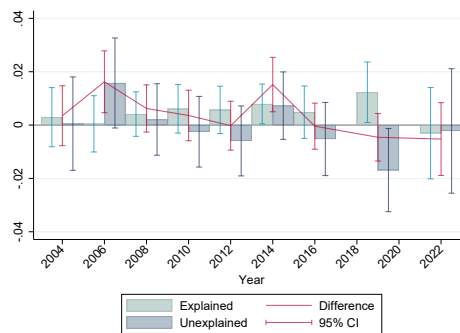
(d) Informal WE to Informal WE



(e) Unemployed to Informal WE



(f) Informal WE to Unemployed



(g) Informal SE to Unemployed

Figure 4: **Pivotal Results** This figure illustrates results from the Blinder-Oaxaca twofold decomposition, including the difference coefficient, explained and unexplained components, and 95% confidence intervals for each variable. This figure only includes 6 out of the 25 results from 2003 to 2022, for the rest of them, please refer to the Appendix. Data was sourced from ENEMDU.

more than half by the explained factor. One of the most important observable variables in labor rotation is years of schooling. Thus, the unexplained gap in individuals who remain as formal wage earners could be attributable to women having, on average, more years of education than men in Ecuador (Benítez and Espinoza, 2018).

Shifting focus to the probability of transitioning from informal wage earner to formal wage earner (Panel b, Figure 4), even though the difference coefficient is not significant for any year, the explained and unexplained components are, particularly the explained effect. In almost the entirety of the analyzed period, women who participate in the informal labor market as wage earners are provided with better measurable variables. This explains why, during half of the study period, women were more prone to transition to the formal labor market, although this disparity takes low values, with the highest difference reaching 2%.

In addition, in almost half of the panels, there was an evident unexplained coefficient that contributed to that of the difference in probability, reinforcing the idea that women may be discriminated in the insertion to the formal labor market, despite having better characteristics than men. This is supported by the argument that as job quality improves (i.e., larger establishments with a higher probability of having social security), there are more barriers of entry for women (Benítez and Espinoza, 2018).

However, it is important to note that the unexplained component does not necessarily reflect a gender bias effect. Characteristics in labor market transitions that cannot be measured include preferences, psychological traits, among other factors that may or may not be product of discrimination and gender norms in society (Petrongolo and Ronchi, 2020). Thus, other non-measurable variables, such as differences in preferences between men and women, may be linked to the gap in likelihood of transitioning from informal to formal employment.

Next, no matter what the previous labor status was, men are more prone to migrate to informal employment as wage earners (see Figure 7c and Figure 9c in Appendix A). In the

majority of years, transitions from formal wage earner/informal wage earner/unemployed to informal wage earner show that a significant proportion of the difference in likelihood is due to the unexplained component (Panel c, d & e, Figure 4). The magnitude of the effect is best exemplified with the probability of remaining as an informal wage earner, where the unexplained effect accounts for nearly the entirety of the disparity between men and women in this transition. However, in these particular cases, discrimination against women is a positive outcome, as they are less prone to transition to the informal labor market.

This negative effect on men can be attributed to the fact that women exit employment voluntarily, while men tend to exit employment due to employer-initiated reasons (i.e., dismissals or layoffs) (Theodossiou and Zangelidis, 2009). In the context of Ecuador, as mentioned earlier, because of high costs associated with layoffs, employers tend to remove workers from payroll instead of dismissing them, leading to informal employment as wage earners. Men being more likely to be dismissed rather than resign is a labor market preference that cannot be measured, which is why it contributes to the unexplained component of the difference in probability between men and women.

Continuing this line of reasoning, the argument that women are more inclined to resign than to be dismissed compared to men is evidenced in the only labor market transitions that show a higher likelihood for women, the ones that migrate to unemployment (see Figure 6e and Figure 7e in Appendix A). Even though the difference coefficient is not significant for every year in the transitions from informal wage earner/informal self-employed to unemployed (Panel c & h, Figure 4), its significance shows in peak periods of both transitions. Similarly to the analysis of men being more prone to transition to informal employment due to discrimination against women, in these cases, the unexplained component would translate to discrimination against men. Then again, this bias works in favor of men, as they are less likely to migrate to unemployment. Nevertheless, there is no evidence of a significant unexplained component in most of these transitions.

There is, however, evidence suggesting that this gap between men and women is due to explained characteristics. This may be attributed to the influence that raising a child has on the engagement of women in the labor market (Petrongolo and Ronchi, 2020). Motherhood, alongside domestic and family responsibilities, implies that, on average, women work less hours compared to men. This is supported by the fact that, as mentioned above, women tend to exit employment due to employee-initiated reasons.

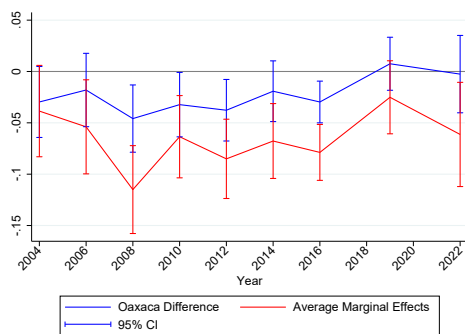
The remaining labor market transitions that were not included in the main analysis reflect similar dynamics to the ones that were already explained in this section, or do not show significant results. The results are graphically detailed in Appendix A.

6 Robustness

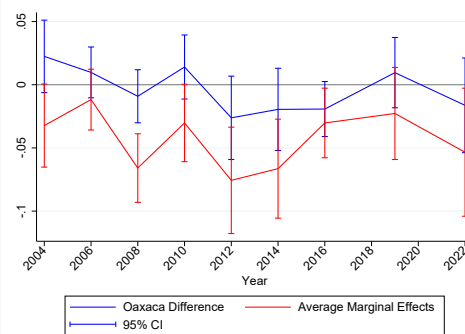
In order to verify the robustness of my results, an average marginal effects analysis (AME) is conducted for each labor market transition over the analyzed period. The aim of the AME analysis is to validate the results of this paper, specifically the effect of gender in labor mobility. The findings of these estimations are depicted in Figure 5, which compares the partial derivative coefficients alongside the difference coefficients from the Oaxaca decomposition, including 95% confidence intervals.

A probit regression is estimated using the dummy variable *women*, which is coded as 0 when the individual is a woman and 1 for male individuals. The same set of independent variables used in the estimation of the Blinder-Oaxaca twofold decomposition is applied to the probit regressions. As with the previous section, only pivotal robustness results are presented, for the rest of results, please refer to Appendix B.

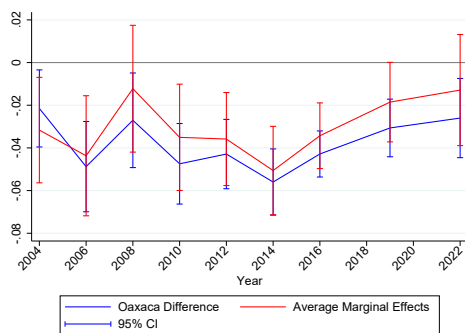
As displayed in Figure 5, the coefficients obtained from the AME analysis follow a fairly similar trend to those from the Oaxaca decomposition, converging to a single trend in most



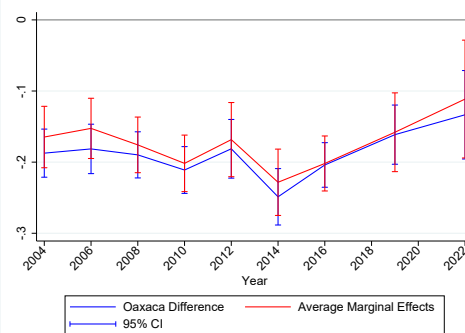
(a) Formal WE to Formal WE



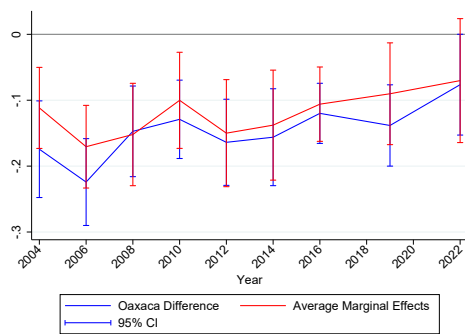
(b) Informal WE to Formal WE



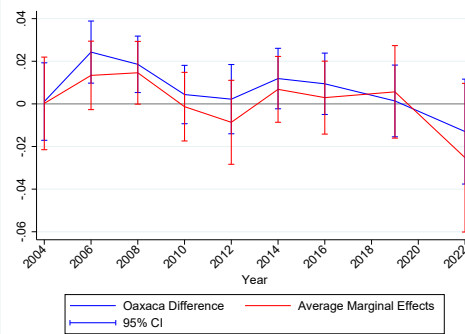
(c) Formal WE to Informal WE



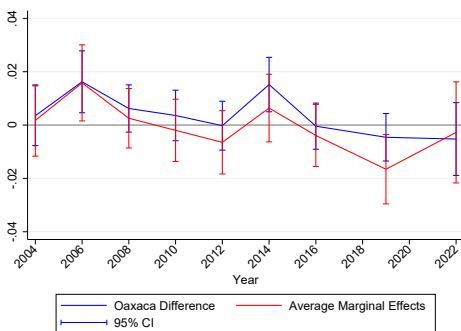
(d) Informal WE to Informal WE



(e) Unemployed to Informal WE



(f) Informal WE to Unemployed



(g) Informal SE to Unemployment

Figure 5: **Robustness Results** This figure illustrates results from partial derivative coefficients from the AME analysis, which is conducted as a robustness check, as well as difference coefficients from the Blinder-Oaxaca decomposition, with 95% confidence intervals. This figure only includes 7 out of the 25 results from 2003 to 2022, for the rest of them, please refer to the Appendix. Data was sourced from ENEMDU.

cases. Given that the partial derivative represents the marginal change of being a woman in the probability of transitioning in the labor market, results are expected to be analogous to the difference coefficients.

The third transition (Panel a, Figure 5), for instance, implies that men have a higher probability of remaining in the formal labor market compared to women, which was also proved with the Oaxaca decomposition, almost in the same proportion. Even significance is replicated, on average, in both analysis, as results who were significant in the main analysis are significant in the robustness check too.

A similar situation is depicted in the rest of transitions. It is proved by both methods than men are more prone to transition to the formal labor market, but also to informality, whereas women are more likely to migrate to unemployment. While interactions remain almost the same for all transitions, the partial derivative coefficients are different in proportions to the difference coefficients.

For instance, according to the Oaxaca methodology, in 2012, women were 2.6% less likely to migrate from informal to formal wage earner. Whereas, according to the AME, this probability is more than 7 percentage points lower for women compared to men. Nevertheless, the direction of the probabilities of the labor market transitions have been corroborated by the AME regressions.

The remaining robustness treatments that were not included in the main analysis reflected similar dynamics to the ones that were already explained in this section. The results are graphically detailed in Appendix B.

In summary, my results indicate that men are more likely to migrate to both, better and worse employment labor status, with the exception of labor market transitions that lead to unemployment, where the gender gap "favors" women. Although there is evidence of possible dis-

crimination against women in certain transitions, the difference in likelihood is also explained by non-measurable characteristics that shape the Ecuadorian labor market.

7 Conclusion

In this paper, I analyzed the evolution of gender gap in labor market transitions in Ecuador from 2003 to 2022. This study not only measured the disparity between men and women in labor mobility dynamics, but it also divided the sources of said difference into explained and unexplained components. This was executed through a Blinder-Oaxaca twofold decomposition, after sample selection bias was corrected through the utilization of the Heckman two-stage model. In order to apply this framework, I employed information from ENEMDU's rotating panels from the last 20 years. This paper classified employment status into formal and informal employment, as well as wage earners, self-employed and unemployed.

Findings evidenced that men present more labor market mobility than women, particularly with regard to formal and informal employment transitions, no matter if the individual was self-employed or wage earner. Whereas women exhibit a higher likelihood of migrating to unemployment than men. Results also showed crucial insights regarding explained and unexplained components. While evidence suggested possible presence of discrimination against women in many transitions, it is not a decisive conclusion. This is due to the notion that, although gender bias is a non-measurable characteristic, there are other factors that are not observable either that can contribute to the gap, despite not being an indication of discrimination. Such unseen elements comprise preferences and psychological traits, for example.

The main limitation of this paper is that it does not include additional variables that could have helped to enriched the analysis. This was primarily due to lack of available information. For instance, the civil status variable was not included in ENEMDU's survey in the first years of the analyzed period. Nevertheless, robust findings were accomplished with the available vari-

ables included in this study, shedding light on the challenges faced by women when migrating to a better employment situation in Ecuador, whether it is because of discrimination or other unseen factors.

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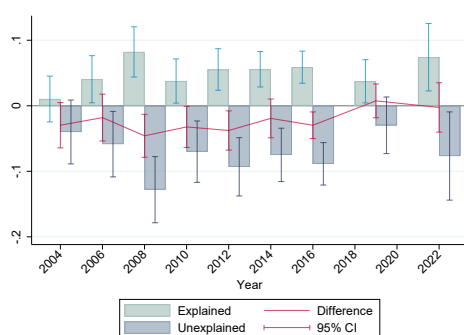
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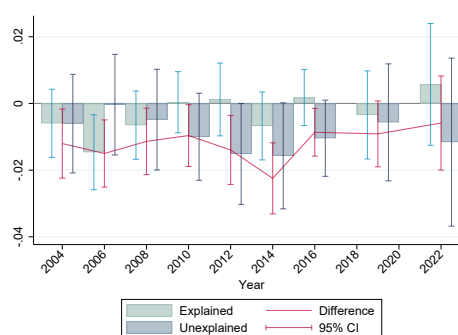
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9 Appendix

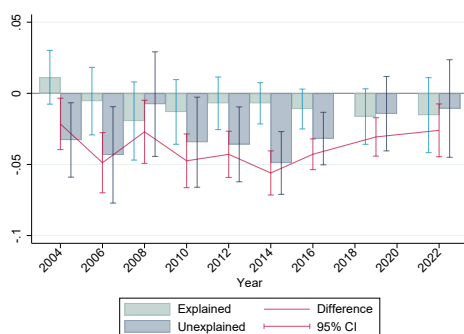
9.1 Appendix A: Blinder-Oaxaca decomposition results



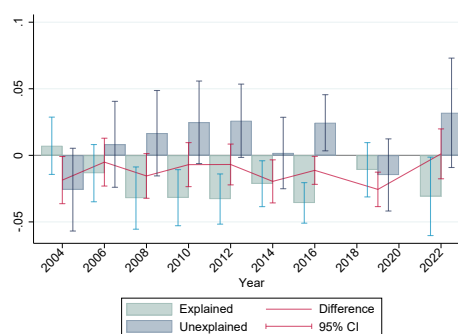
(a) Formal WE to Formal WE



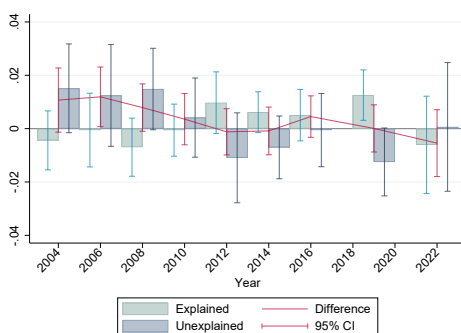
(b) Formal WE to Formal SE



(c) Formal WE to Informal WE

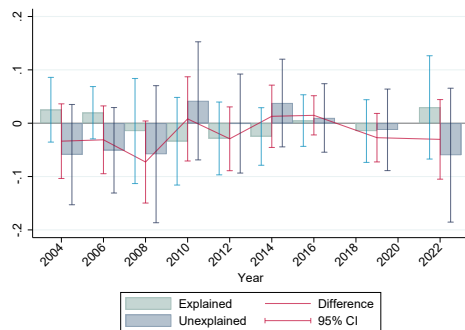


(d) Formal WE to Informal SE

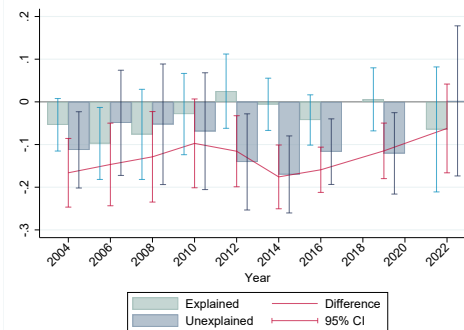


(e) Formal WE to Unemployed

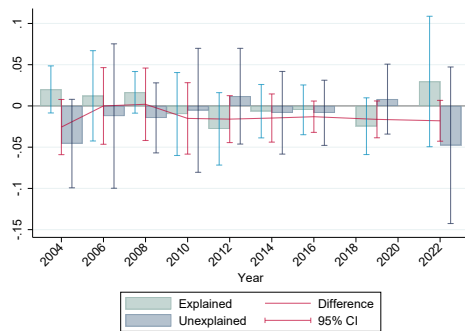
Figure 6: Blinder-Oaxaca decomposition results for Formal Wage Earners This figure illustrates results from the Blinder-Oaxaca twofold decomposition, including the difference coefficient, explained and unexplained components, and 95% confidence intervals for each variable. This figure only includes results from 2003 to 2022 from individuals who were formal wage earners the previous period. Data was sourced from ENEMDU.



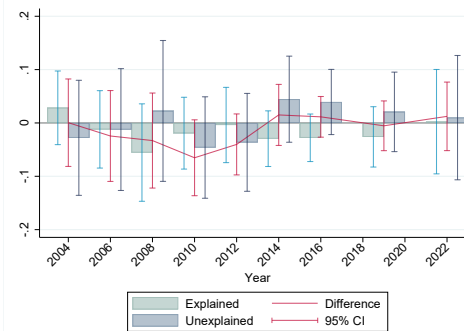
(a) Formal SE to Formal WE



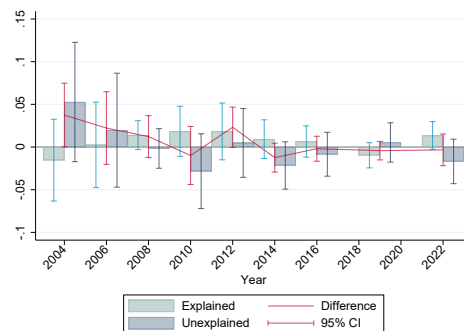
(b) Formal SE to Formal SE



(c) Formal SE to Informal WE

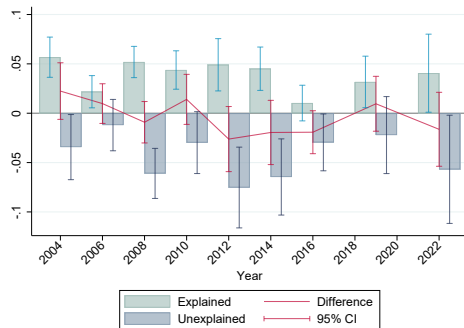


(d) Formal SE to Informal SE

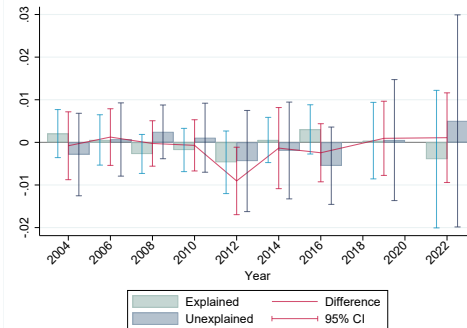


(e) Formal SE to Unemployed

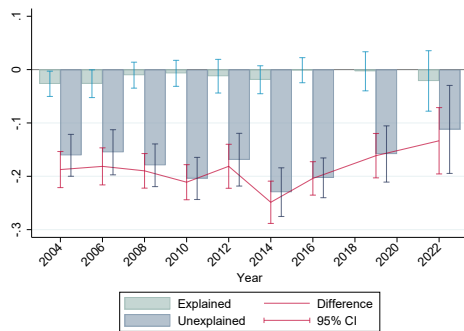
Figure 7: **Blinder-Oaxaca decomposition results for Formal Self-Employed** This figure illustrates results from the Blinder-Oaxaca twofold decomposition, including the difference coefficient, explained and unexplained components, and 95% confidence intervals for each variable. This figure only includes results from 2003 to 2022 from individuals who were formally self-employed the previous period. Data was sourced from ENEMDU.



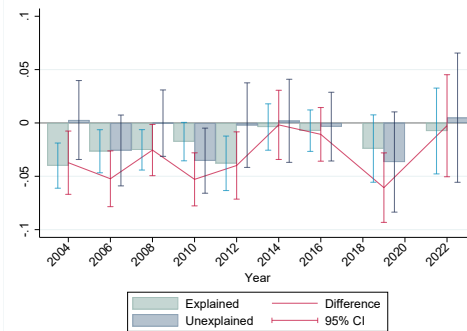
(a) Informal WE to Formal WE



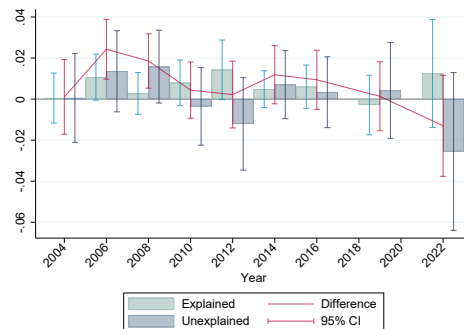
(b) Informal WE to Formal SE



(c) Informal WE to Informal WE

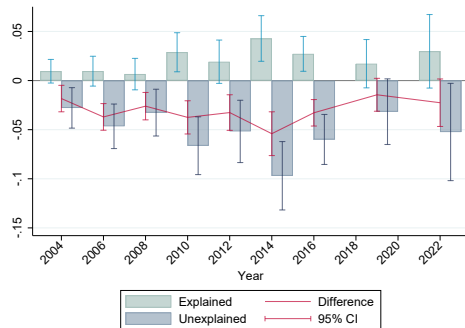


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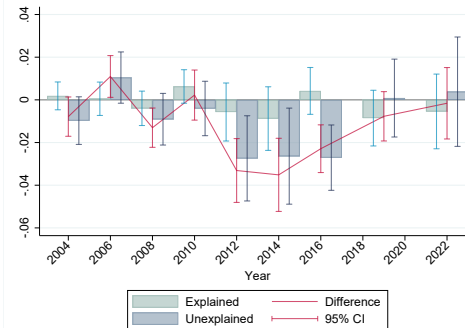


(e) Informal WE to Unemployed

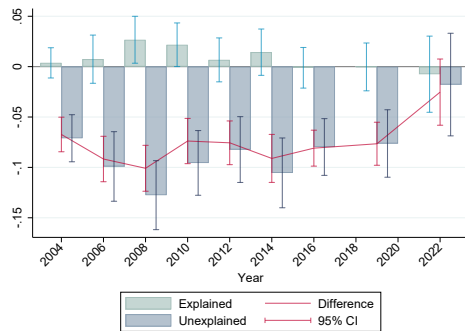
Figure 8: **Blinder-Oaxaca decomposition results for Informal Wage Earners** This figure illustrates results from the Blinder-Oaxaca twofold decomposition, including the difference coefficient, explained and unexplained components, and 95% confidence intervals for each variable. This figure only includes results from 2003 to 2022 from individuals who were informal wage earners the previous period. Data was sourced from ENEMDU.



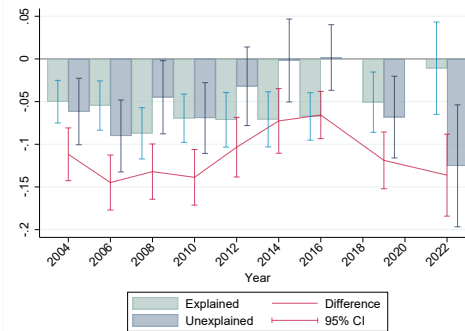
(a) Informal SE to Formal WE



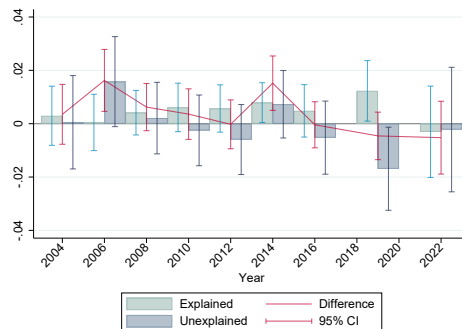
(b) Informal SE to Formal SE



(c) Informal SE to Informal WE

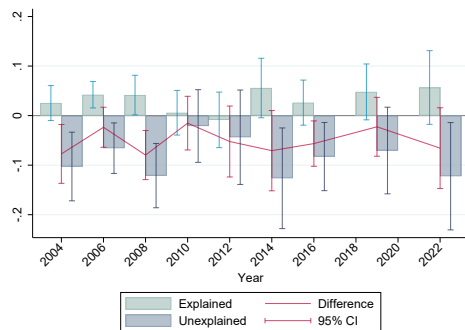


(d) Informal SE to Informal SE

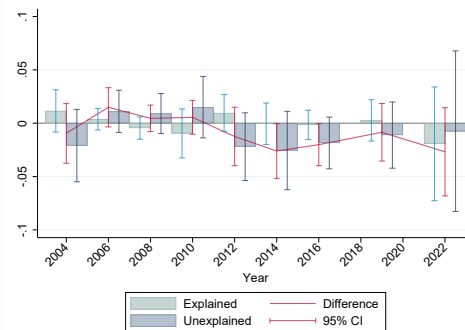


(e) Informal SE to Unemployed

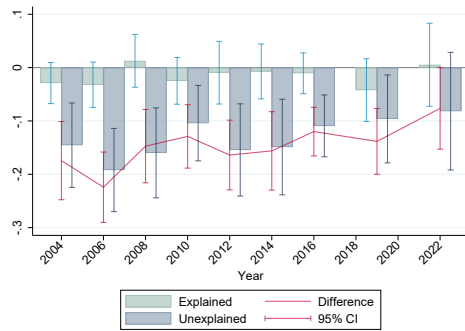
Figure 9: **Blinder-Oaxaca decomposition results for Informal Self-Employed** This figure illustrates results from the Blinder-Oaxaca twofold decomposition, including the difference coefficient, explained and unexplained components, and 95% confidence intervals for each variable. This figure only includes results from 2003 to 2022 from individuals who were informally self-employed the previous period. Data was sourced from ENEMDU.



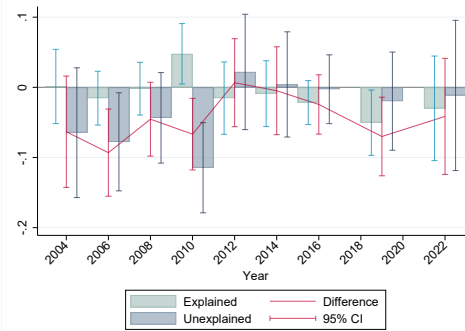
(a) Unemployed to Formal WE



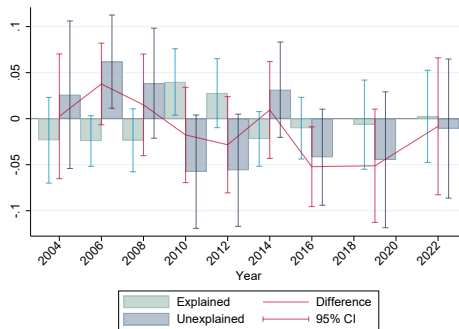
(b) Unemployed to Formal SE



(c) Unemployed to Informal WE



(d) Unemployed to Informal SE



(e) Unemployed to Unemployed

Figure 10: **Blinder-Oaxaca decomposition results for Unemployed** This figure illustrates results from the Blinder-Oaxaca twofold decomposition, including the difference coefficient, explained and unexplained components, and 95% confidence intervals for each variable. This figure only includes results from 2003 to 2022 from individuals who were unemployed the previous period. Data was sourced from ENEMDU.

9.2 Appendix B: Robustness results

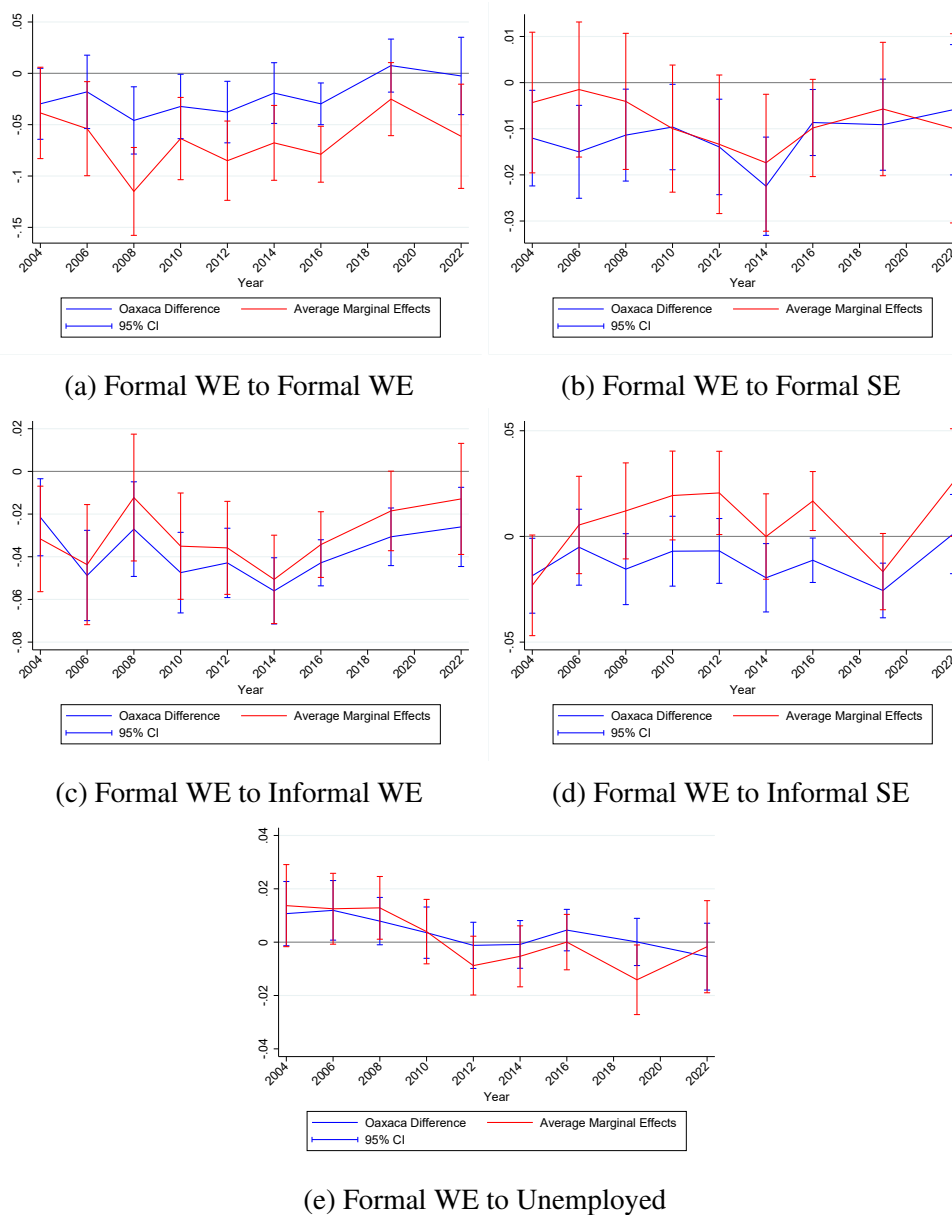
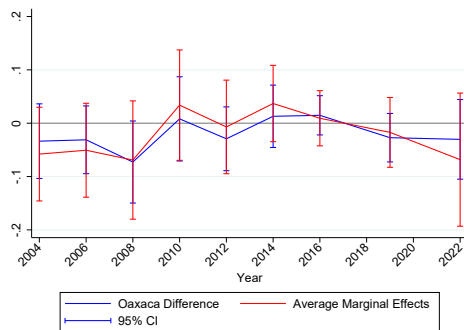
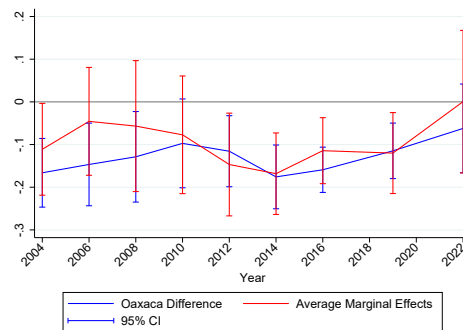


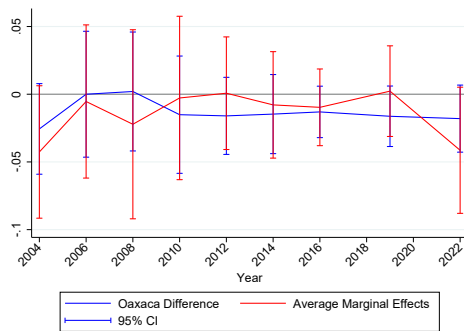
Figure 11: **Robustness results for Formal Wage Earners** This figure illustrates results from partial derivative coefficients from the AME analysis, which is conducted as a robustness check, as well as difference coefficients from the Blinder-Oaxaca decomposition, with 95% confidence intervals. This figure only includes results from 2003 to 2022 from individuals who were formal wage earners the previous period. Data was sourced from ENEMDU.



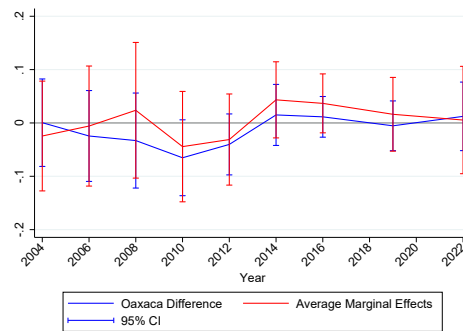
(a) Formal SE to Formal WE



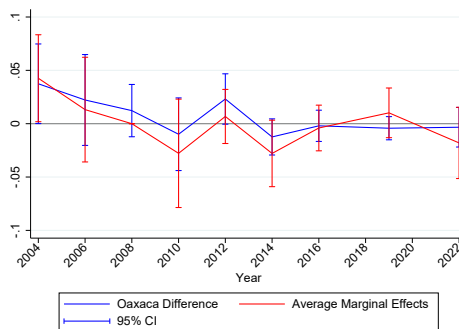
(b) Formal SE to Formal SE



(c) Formal SE to Informal WE

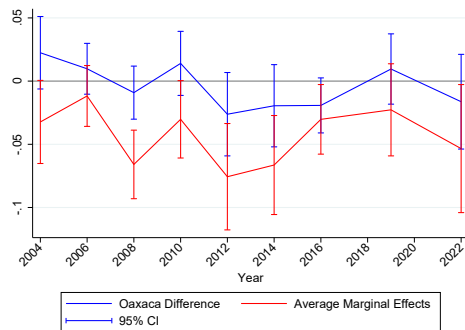


(d) Formal SE to Informal SE

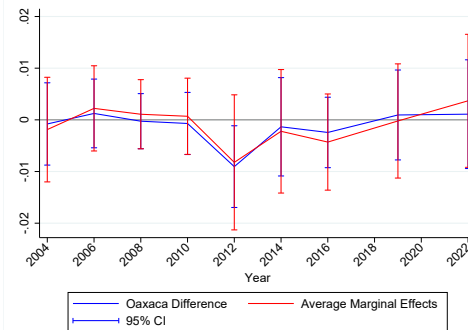


(e) Formal SE to Unemployed

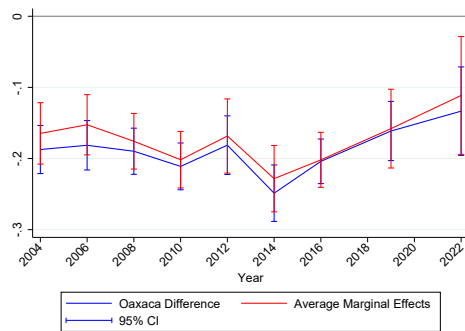
Figure 12: Robustness results for Formal Self-Employed This figure illustrates results from partial derivative coefficients from the AME analysis, which is conducted as a robustness check, as well as difference coefficients from the Blinder-Oaxaca decomposition, with 95% confidence intervals. This figure only includes results from 2003 to 2022 from individuals who were formally self-employed the previous period. Data was sourced from ENEMDU.



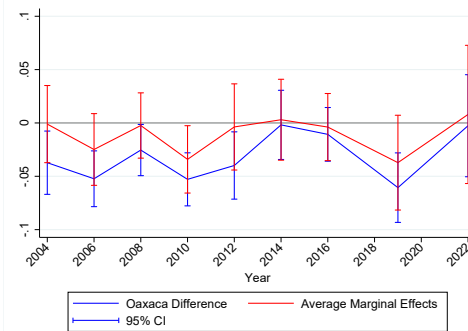
(a) Informal WE to Formal WE



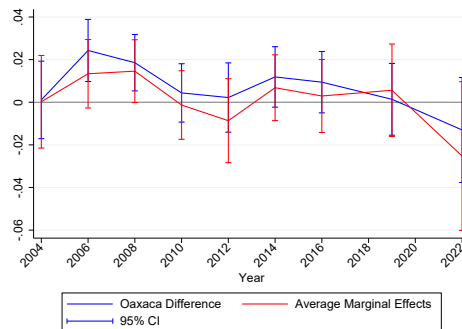
(b) Informal WE to Formal SE



(c) Informal WE to Informal WE

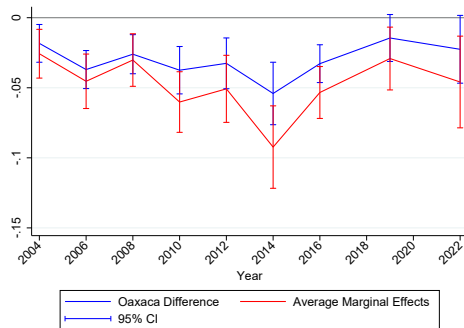


(d) Informal WE to Informal SE

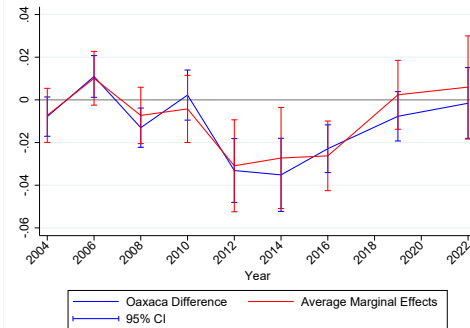


(e) Informal WE to Unemployed

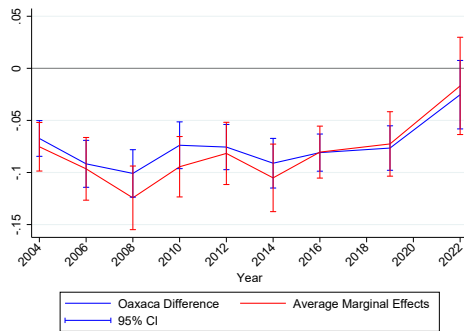
Figure 13: **Robustness results for Informal Wage Earners** This figure illustrates results from partial derivative coefficients from the AME analysis, which is conducted as a robustness check, as well as difference coefficients from the Blinder-Oaxaca decomposition, with 95% confidence intervals. This figure only includes results from 2003 to 2022 from individuals who were informal wage earners the previous period. Data was sourced from ENEMDU.



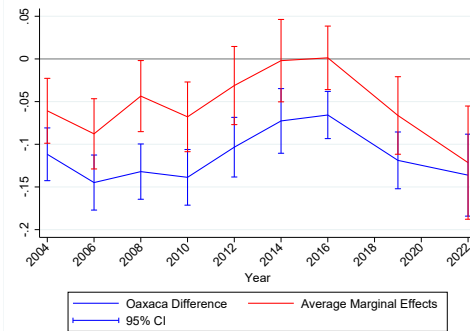
(a) Informal SE to Formal WE



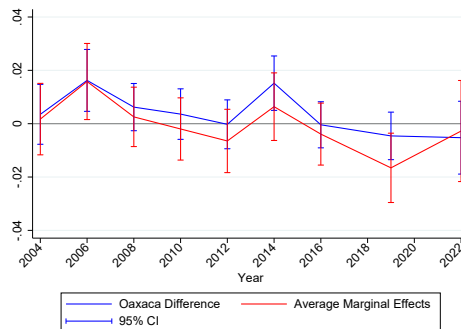
(b) Informal SE to Formal SE



(c) Informal SE to Informal WE

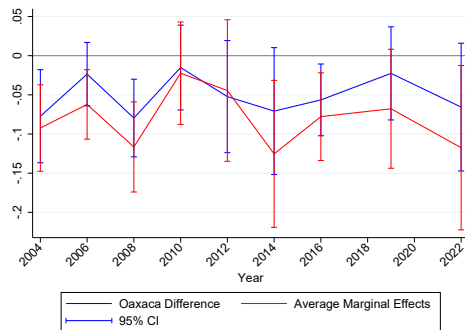


(d) Informal SE to Informal SE

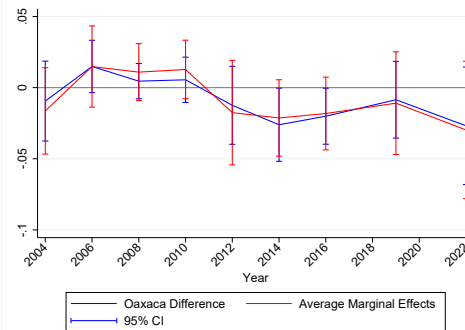


(e) Informal SE to Unemployed

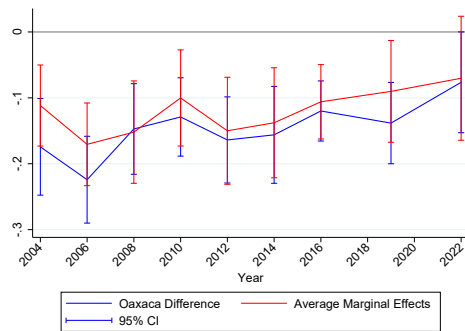
Figure 14: **Robustness results for Informal Self-Employed** This figure illustrates results from partial derivative coefficients from the AME analysis, which is conducted as a robustness check, as well as difference coefficients from the Blinder-Oaxaca decomposition, with 95% confidence intervals. This figure only includes results from 2003 to 2022 from individuals who were informally self-employed the previous period. Data was sourced from ENEMDU.



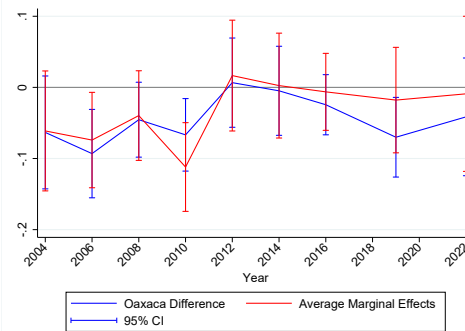
(a) Unemployed to Formal WE



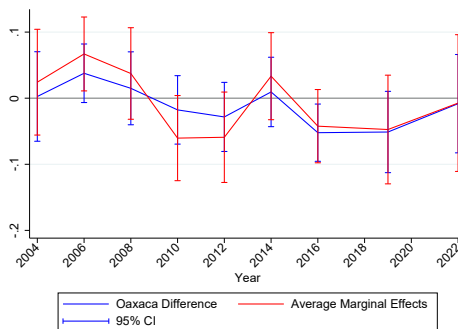
(b) Unemployed to Formal SE



(c) Unemployed to Informal WE



(d) Unemployed to Informal SE



(e) Unemployed to Unemployed

Figure 15: **Robustness results for Unemployed** This figure illustrates results from partial derivative coefficients from the AME analysis, which is conducted as a robustness check, as well as difference coefficients from the Blinder-Oaxaca decomposition, with 95% confidence intervals. This figure only includes results from 2003 to 2022 from individuals who were unemployed the previous period. Data was sourced from ENEMDU.