The non-existent gender gaps in informal employment

Isaac Lopez-Moreno Flores

Abstract

Three widely accepted beliefs persist in the literature regarding gender participation gaps in informal employment: 1) women are over-represented in the informal sector, 2) they have higher informal employment rates across countries, and 3) they are more likely to work informally than men. This paper challenges these assertions using disaggregated data from Mexico and cross-country data from the International Labour Organization (ILO). First, it highlights that men outnumber women in the informal workforce in Mexico and globally. Second, an analysis of ILO-harmonised data covering 112 countries reveals that men's informal employment rates exceed women's in half of these countries when estimations consider agriculture, industry, and services. Third, probit regressions indicate that Mexican men are more likely to work informally than Mexican women. The study suggests that applying the methodology outlined in this paper to microdata from other countries would likely yield the same regression results. The paper also highlights various oversights that contributed to the perception of women's predominance in informal jobs. Finally, the paper discovers and discusses a previously undocumented pattern across countries: there is a reversal of gender participation gaps in informal employment as part of economic development.

Keywords: Informal economy, informal employment, informal sector, gender gaps, gender equality, decent work.

JEL Codes: J16, J21, J43, J46, J82

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1 Introduction

The understanding of gender participation gaps in informal employment has been shaped by a few widely accepted ideas. First, it is commonly asserted that women are over-represented in the informal sector worldwide (Sethuraman, 1998; Chen, 2001; Gallaway and Bernasek, 2002; Chant and Pedwell, 2008). Second, it is often mentioned that in the majority of countries women have higher informal employment rates than men (Bonnet *et al*., 2019; OECD, 2019; Gardner *et al*., 2022; ILO, 2023). Third, it is frequently claimed that women are more likely to have informal jobs compared with men (Losby *et al*., 2002; McCaig and Pavcnik, 2015; Malta *et al*., 2019).

Despite the widespread acceptance of these claims, there has been insufficient scrutiny of the empirical foundations that support them. Hence, this paper addresses a critical question: Are women genuinely more likely to be informally employed than men? To answer this question, the research starts by documenting various oversights in the existing literature about gender participation gaps in informal employment. Then it presents evidence challenging the three stylized facts previously mentioned.

The claim that women are over-represented in the informal sector is particularly ambiguous and warrants careful interpretation. This research interprets that statement as an implicit suggestion that there are more women than men working informally in most countries. Hence, I argue that the proper way to assess the validity of this statement is not by comparing informal employment rates between men and women, but rather by studying the gender composition of the informal workforce. In the case of Mexico, the statistics indicates that in 2019 almost 31.5 million people worked informally, with 18.7 million being men and 12.7 million women. The International Labour Organization (2018) also estimated that 2 billion workers are informally employed worldwide, with 740 million being women while 1,260 million are men. Relying on the previous data, this paper proposes that the notion of women being over-represented in informal employment should be reconsidered, as there are more men working informally not only in Mexico but worldwide.

Secondly, this paper challenges the assertion that women have higher informal employment rates than men across countries. To assess the validity of this claim, it is important to explain that informal employment rates typically capture the proportion of women (or men) working informally as a share of the total working population. However, as this research shows,

the standard for measuring informal employment rates has primarily focused on the industrial and service sectors. This paper outlines the reasons why agricultural activities were often excluded from these estimations. Furthermore, it highlights that the agricultural workforce across all regions is predominantly male. Hence, this paper explains that the exclusion of agriculture is a key factor behind previous research suggesting that women had higher informal employment rates than men.

After clarifying these points, this paper demonstrates that the claim of women having higher informal employment rates than men across countries is not supported by the latest data. Based on statistics provided by the International Labour Organization (2018), I analysed data from 112 countries with estimations of informal employment rates that considered not only industrial and service jobs, but also agricultural activities. The analysis revealed that in half of these countries men's informal employment rates exceeded those of women, whereas in the other half, women had higher informality employment rates than men. The paper presents evidence indicating that the exclusion of agriculture leads to considerable underestimations of informal employment rates for men. Hence, adding agriculture provides a more balanced perspective of gender participation gaps in informal employment across countries.

Finally, this research challenges the prevailing belief that women are more likely to work informally compared with men by demonstrating that this conclusion is highly dependent on the context of the analysis. A probit model using data from Mexico reveals that, when considering the entire working-age population, men are more likely to hold informal jobs. This finding is consistent with the statistic showing that men represent 60% of the informal workforce in Mexico, whereas women represent the other 40%. Conversely, when the analysis is limited to the employed population, the results indicate that working women in Mexico are more likely to hold informal jobs than working men. This aligns with the fact that the informal employment rates in Mexico are slightly higher for women (55.8%) than for men (54.1%).

These results highlight the importance of clearly defining the scope of analysis in regression models based on the selected sample. I explain that generalisations about the entire population should be drawn from the working-age population. Conversely, if the analysis is limited to the employed population, this must be explicitly stated, and the results should be interpreted solely within that context. Failure to do so may perpetuate the erroneous conclusion that women are more likely to work informally and are over-represented in informal employment.

After a thorough examination of statistics on informal employment rates, this research uncovers unexpected patterns that challenge the conventional belief that women predominate in informal labour markets. Consequently, this paper makes a significant contribution to the literature by identifying methodological flaws that led researchers and international organisations to this misguided conclusion. The implications of these findings are critical not only for researchers but also for policymakers, as misconceptions about gender gaps in informal employment can lead to ineffective or misguided strategies to reduce informality. Therefore, this paper challenges widely held assumptions about gender disparities in informal employment and emphasises the need for gender-sensitive strategies grounded in more precise interpretations of labour statistics.

The paper is organised as follows: Section 2 provides background information on some of the most common oversights in the literature about gender participation gaps in informal employment. Section 3 presents a descriptive analysis of informal employment rates in Mexico, Latin America, and across countries that already include the agricultural sector. Section 4 outlines the data and the empirical model employed to evaluate the hypothesis that women are more likely to have an informal job compared with men. Section 5 presents the results of the regression analysis, while section 6 includes a brief discussion of the results. Finally, Section 7 presents the conclusions and the policy implications of the research findings.

2 Background

Research on gender gaps in labour informality can be broadly divided into two main areas of study. The first area focuses on the gender pay gap within informal jobs. Studies in this field have consistently shown that women, compared with men, are concentrated in the lowest-paid positions within informal labour markets. The second area of research examines gender participation gaps in informal employment. This study falls into the latter category, as it primarily investigates female participation in informal employment without delving into gender pay disparities.

In the subsequent sections, I provide clear and concise explanations to identify and discuss three common oversights found in studies discussing gender participation gaps in informal employment. Additionally, I present evidence suggesting that these inaccuracies have led researchers and international organizations to the misguided conclusion that there is a significant gender gap in female participation in informal employment.

2.1 Mixing concepts: informal sector and informal employment

In the literature about gender participation gaps in informal labour, it has been claimed that women are over-represented in the informal sector. Sethuraman (1998) said that "women in all age groups depend on the informal sector more heavily than men" and that they are "over-represented in this sector". Chen (2001) claimed that "women are over-represented in the informal sector worldwide". Furthermore, Gallaway and Bernasek (2002) highlighted that in developing countries a large portion of economically active population works in the informal sector, but "women in particular are disproportionately represented in this sector".

When these authors made such assertions, there was still very little discussion on how to accurately measure labour informality. At that time, the primary criterion for identifying individuals as part of the informal sector was whether they worked in enterprises with fewer than five employees. However, this criterion is no longer considered an appropriate approach to estimate informal labour. Therefore, the aim of this section is to provide a brief explanation of the concepts "informal sector" and "informal employment". Furthermore, this section explains why these concepts should not be used as synonyms, and why the former has become outdated while the latter is the current approach to measure informality employment rates across countries.

The International Labour Organization (ILO) has organised several conventions with labour statisticians to establish accurate methods for measuring different types of labour informality. During these conventions, they determine which terms should be used to refer to specific aspects of labour informality. ILO (2013) provided a concise overview of several terms to measure different types of labour informality and the rationale for having different concepts. The report highlights that the terms "*informal sector*", "*informal economy*", "*employment in the informal sector*", and "*informal employment*" are not synonyms, and they should not be used interchangeably. ILO (2013) also pointed out that "the nuances associated with each term are extremely important from a technical point of view".

Among the concepts endorsed by the International Labour Organization, two of the most frequently used terms are "informal sector" and "informal employment". Hence, it is essential to understand how these two concepts should only be used under specific contexts. For instance, "informal sector" is an enterprise-based concept and refers to people working in unregistered and/or small unincorporated private enterprises. The criterion for this concept is simple: workers are considered part of the informal sector if they are employed in workplaces with fewer than five employees.

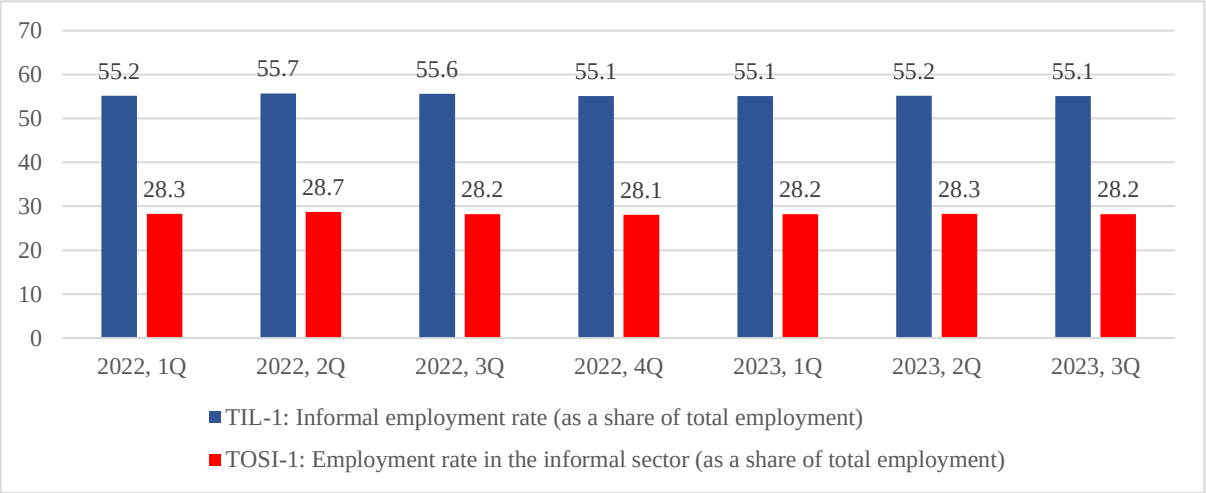
On the other hand, the term "informal employment" is a job-based concept. This term is used to identify individuals who have informal jobs in the informal sector, informal jobs in the formal sector, and informal jobs within their households. Thus, the labour status of survey respondents is determined not by the characteristics of the enterprise where they work, but by specific characteristics and standards of the job they perform. More precisely, holding an informal job typically entails a lack of employment benefits, legal protections, and basic social protection schemes such as pension plans and medical insurance.

At the beginning of the 21st century, the prevailing method for estimating labour informality was based on the concept "informal sector". This enterprise-based criterion considers that someone is part of the informal sector if they work in companies with fewer than five employees. Nevertheless, this measure was excluding from the estimations lots of workers who held informal jobs but were employed in enterprises with more than five employees. Additionally, Chen (2012) explained that in 2003, the International Labour Organization recognised the existence of informal jobs within the formal sector. Consequently, ILO introduced the concept of "informal employment", an expanded definition that encompasses

not only informal jobs within the informal sector but also informal jobs in the formal sector and within households.

Mexico has data to report the size of the informal sector as well as the informal employment rates in the country. Figure 1 presents a comparison of both estimates for 2022 and 2023. The chart shows that around 55% of workers in Mexico hold informal jobs. On the other hand, approximately 28% of workers in Mexico have been classified as working in the informal sector. Therefore, this figure is useful in illustrating that estimates of the size of the informal sector are just capturing a portion of informal labour.

Figure 1 – Informal employment rates and employment rates in the informal sector (Mexico, 2022/2023)

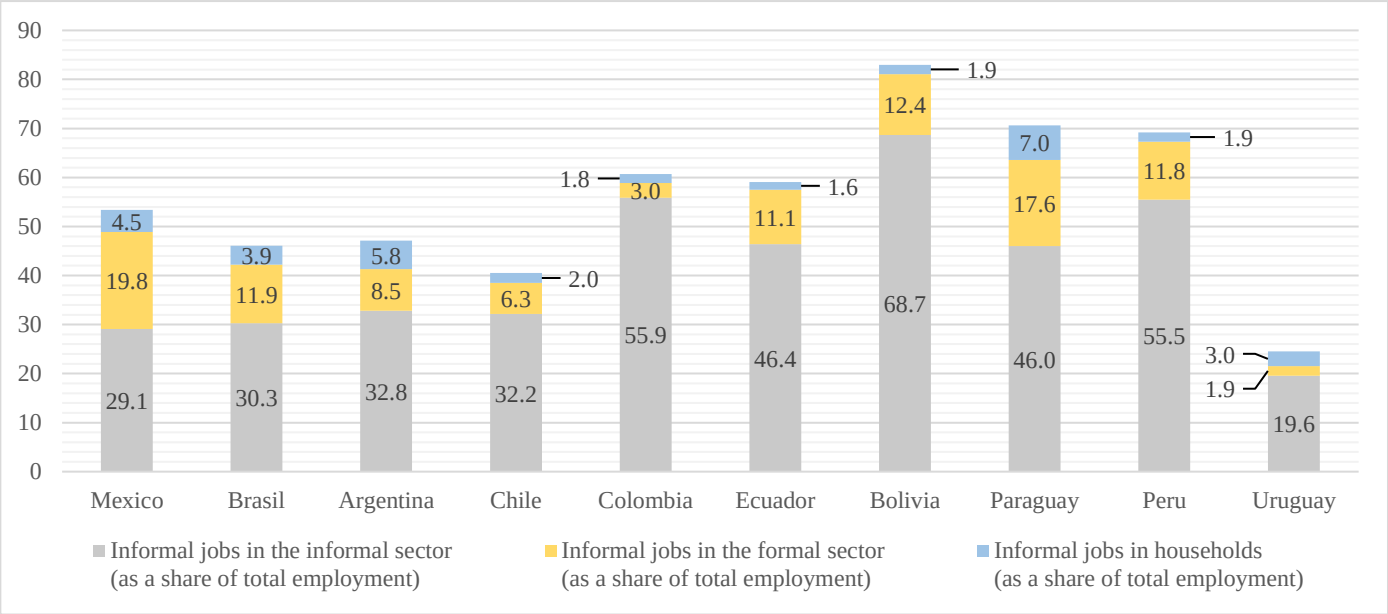


Source: Mexico's ENOE household surveys (INEGI)

It is pertinent to further clarify the differences between "informal employment" and the "informal sector" by presenting a practical example. Imagine a group of fifteen bricklayers employed by an architect in a developing country. This architect has a company formally registered with the national government. However, the bricklayers do not have written contracts, they are paid in cash at the end of each week, and they do not have any type of medical insurance or pension scheme. Based on the definition of "informal sector" these bricklayers would be considered part of the formal sector because the architect's company is formally registered with the government. Conversely, using the "informal employment" definition, the bricklayers would be classified as part of the informal workforce because the architect hired them informally. This is a typical case of an informal job in the formal sector.

The previous discussion illustrates that shifting from the enterprise-based concept of 'informal sector' to the job-based concept of 'informal employment' offers a more comprehensive understanding of labour informality as it captures different types of informal jobs. Figure 2 illustrates this by showing the composition of informal employment rates in Latin American countries during 2018. The chart shows that informal employment rates are estimated after considering three types of informal employment: 1) in the informal sector, 2) in the formal sector, or 3) within households.

Figure 2 - Composition of informal employment rates
in Latin American Countries (2018)



Source: International Labour Organization (2018)

This chart illustrates that the informal sector is just one component of informal employment rates. The figure also shows that the sum of the three main types of informal jobs is used to estimate the informal employment rates for each country. In the case of Mexico, the chart indicates that 29.1% of the employed population work informally in the informal sector. Additionally, 19.8% of Mexican workers have an informal employment in the formal sector, while 4.5% work informally within a household. The sum of these three types of informal employment indicates that in 2018 Mexico's informal employment rate was 53.4%, according to ILO (2018).

Finally, Figure 2 also reveals other relevant insights of labour informality in Latin America. Bolivia has the highest informal employment rates among the 10 most populous countries in the region (83%). Paraguay exhibits the highest percentage of people with informal jobs within their households (17.6%). Furthermore, Mexico shows the highest percentage of people with informal jobs in the formal sector (19.8%). This represents an intriguing avenue for future research. According to these estimates, Mexico had the highest share of formal companies employing workers informally in Latin America. It would be interesting to investigate whether this situation has changed after the elimination of outsourcing practices in Mexico since 2021.

To conclude this section, I present data from Mexico to further elucidate the differences between "informal employment" and "informal jobs in the informal sector". In Mexico, the ENOE survey allows for the identification of various business characteristics where respondents are employed. This includes determining the primary economic sector of the business unit and, in some cases, specific economic activities within that sector. This level of detail is possible because Mexico adopted the North American Industry Classification System (NAICS) after joining the Free Trade Agreement with Canada and the United States (NAFTA).

This classification system (NAICS) is useful to distinguish different economic activities in Mexico's labour markets. For instance, NAICS identifies individuals working in food and beverage preparation services. It also allows to differentiate between those employed as "street vendors of food and beverages" and those "working in stationary business units selling food and beverages". For practical purposes, I will refer to these categories as "street food vendors" and "restaurant employees" to explain the distinctions between different types of informal employment.

Data from the fourth quarter of 2019 ENOE household survey indicates that 95% of individuals working as street food vendors in Mexico are classified as informal employment in the informal sector. This is understandable if we consider that those selling food and beverages in the streets are typically not registered with the government and they usually have less than 5 people working in the business unit. In contrast, there is higher heterogeneity among those working as restaurant employees. According to data from ENOE, individuals engaged in this economic activity in the fourth quarter of 2019 reported the following labour statuses:

1) Formal employment in the formal sector (26.65%)

2) Informal employment in the formal sector (25.74%)
3) Informal employment in the informal sector (47.61%)

These statistics reveal important distinctions among Mexicans working as restaurant employees. For instance, around one-quarter of them are classified as formally employed in the formal sector. This means that the restaurants are officially registered with the Mexican government and the employees reported having health insurance and they are contributing to a pension scheme. In contrast, one-quarter of restaurant employees have an informal job within the formal sector. These individuals are employed by restaurants that are officially registered with the government, but they are not receiving social protection benefits such as pension schemes and health insurance. Hence, they are considered informal workers in the formal sector.

Finally, nearly half of the restaurant workers are informally employed in the informal sector. In Mexico, many restaurants fall into this category because they are not officially registered with the government, and they are employing less than 5 people. Additionally, workers in these establishments are hired informally, meaning they lack pension schemes and medical insurance. Hence, they are classified as informal workers in the informal sector.

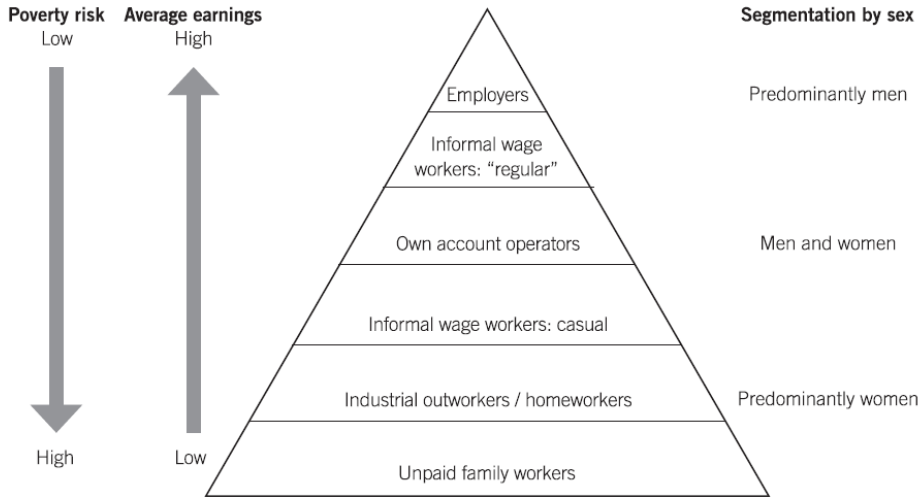
This section primarily discussed the distinctions between the terms “informal sector” and “informal employment” by presenting different examples. Although there are other concepts to measure other dimensions of labour informality, they were not covered in this section. Table 5, included in the appendix, presents an overview with the precise definition of other terms related to labour informality, which have been endorsed (or not) by the International Labour Organization.

To conclude this section, it is essential to revisit the assertion that women are over-represented in the informal sector. As this section has demonstrated, the measurement of the informal sector does not fully capture the multifaceted nature of labour informality. Hence, the main goal of this section was to clarify that this claim of women over-representation in informality were based on data reflecting only one dimension of informal employment. The key takeaway from this section is that the criteria for measuring “informal employment” is more precise and comprehensive than those used to estimate the size of the “informal sector.” With these distinctions now clear, it becomes pertinent to ask: Are women over-represented in informal employment? This question will be answered in the following sections.

2.2 Misinterpreting theories and statistics

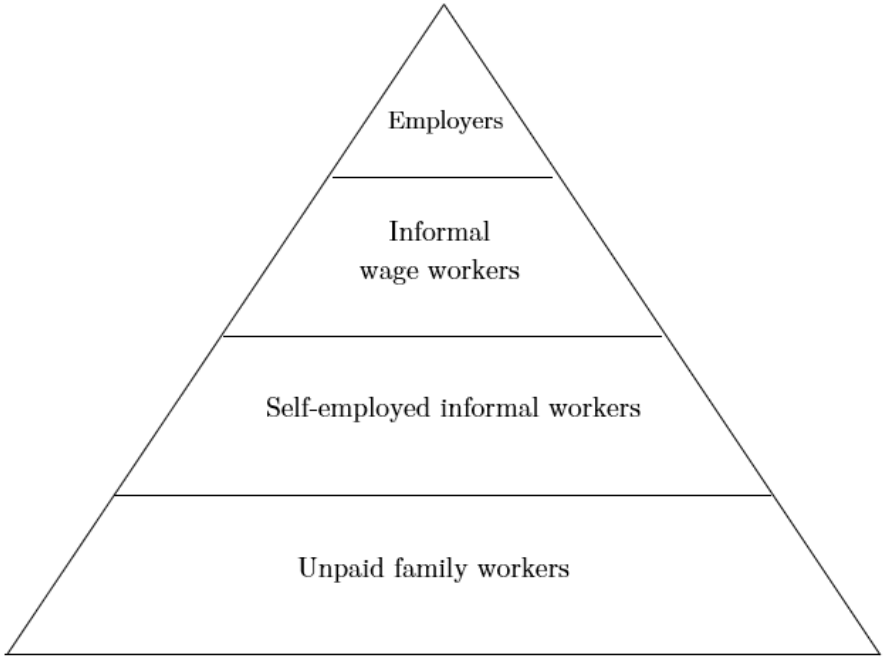
WIEGO is a global network that focuses on studying the working conditions of women in the informal economy. This organization developed the WIEGO model of informal employment, which was illustrated in a working paper written by Martha Alter Chen (2012). Figure 3 shows the most relevant insights from this model, as it presents the concept of job hierarchies within informal labour markets. At the top of the pyramid are informal employers, individuals who run informal businesses successful enough to provide informal jobs to others. In contrast, at the base of the pyramid are the unpaid family workers, who occupy the lowest category of the informal employment as they do not receive any income for their work.

Figure 3 - WIEGO Model of Informal Employment



This model suggests that informal employers tend to have the highest incomes and are predominantly men, while unpaid family workers are predominantly women. Chen (2012) highlighted that this pyramidal model of informality was validated in six developing countries: Costa Rica, Egypt, El Salvador, Ghana, India, and South Africa. This study scrutinises the validity of this model using data from Mexico. Figure 4 presents an analysis of the WIEGO pyramid within Mexico's informal labour markets.

Figure 4 – Simplified WIEGO model of informal employment in Mexico



	Average monthly income	% of men	% of women	Monthly income for men	Monthly income for women	Informal workforce in absolute terms	Share of the informal workforce
Informal Employers	6361.90	77.46	22.54	6800.87	4726.91	1,043,180	3.31
Informal wage workers	4038.50	61.82	38.18	4389.06	3424.07	17,147,881	54.45
Self-employed informal workers	3192.92	58.3	41.7	3397.10	2825.38	10,575,686	33.58
Unpaid family workers	0.00	43.51	56.49	0.00	0.00	2,728,827	8.66
						31,495,574	100

Source: Made by the author with data from the ENOE household survey (4th quarter of 2019)

The statistics presented in Figure 4 confirm that the WIEGO model holds in Mexico. The data shows that, within informal labour markets, the informal employers in Mexico have the highest incomes and are predominantly men. Furthermore, the data indicates that there is a higher proportion of women working as unpaid family workers. Nevertheless, one of the problems in the examination of gender participation gaps in labour informality is that validating this hierarchical model within informal labour markets also confirms that women are over-represented in informal employment. However, this assumption is a misinterpretation of labour statistics.

For instance, Maloney (2004) highlighted that there is a "disproportionate representation of women in informal self-employment" in Mexico and other Latin American countries. He suggests that a plausible explanation for this pattern is the flexibility often found in informal employment, which allows them to combine their need for having income-generating activities with the demanding household responsibilities that are usually attributed to women. Nevertheless, Figure 4 indicates that in Mexico there is a higher share of men working as informal self-employed. In fact, Mexican men predominate in all dimensions of the WIEGO model except for the base of the pyramid, which is comprised of unpaid family workers. Furthermore, Maloney (2004) mentions that self-employment is the "core" of informal labour in Latin America. Nevertheless, in Mexico self-employment represents around one-third of the informal workforce (33.58%), while informal wage employment accounts for more than half of informal labour (54.45%). Hence, there are some discrepancies between the statements presented in Maloney's paper and the data included in this study.

As previously mentioned, this research does not aim to deny the evidence showing that women are more likely to be unpaid family workers nor dismiss the disparities in remuneration that women suffer within informal labour markets. The WIEGO hierarchical model using data from Mexico validates the argument that Mexican men are at the top of the pyramid. Furthermore, it confirms the claim made by Chen (2005) regarding the existence of gender gaps in earnings in all types of informal labour. The figure also shows that Mexican women occupy the lowest-paid positions among informal jobs. Hence, the data also suggests a gender gap in the quality of jobs within informal labour markets. This is in line with recent evidence indicating that women hold jobs of lower quality compared with men (Canavire Bacarreza et al., 2024).

Conversely, the figure refutes the assertion that women predominate in informal self-employment. The data is indicating that there is a greater proportion of men working in this category of informal labour. In fact, Mexican men predominate in all types of informal labour except for those employed as unpaid family workers. This paper has also shown that in 2019 men constitute 60% of the informal workforce in Mexico, while women account for 40%. Hence, this paper shows that validating the WIEGO hierarchical model does not mean that women are over-represent in informal jobs. Instead, it confirms the existence of a gender pay gap and highlights that women hold the lowest-paid roles within informal labour markets.

The conclusion of this section is that the WIEGO model of informal employment and the theory of job hierarchies should not be misinterpreted. Evidence indicates that women are at the bottom of the pyramid within informal labour markets. However, it is also crucial to recognise that a significant number of men are engaged in informal employment. Addressing the Decent Work agenda of the Sustainable Development Goals requires reducing informal employment for men and women. Hence, there is a need to reduce the gender gaps in earnings and improve the quality of jobs that women in informality are experiencing. Nevertheless, it is also crucial to stop overlooking the fact that men are the ones that predominate in informal employment and start focusing efforts on designing proposals of public policy aimed to address both problems.

2.3 Excluding agricultural activities

It is likely that some international organizations or researchers have overestimated gender participation gaps in labour informality without realising that their estimations of informal employment rates were incomplete. It is worth noting that previous estimates of informal employment rates were just considering industrial and service activities, while excluding the agricultural sector. In fact, the International Labor Organization (2013) explained that excluding agricultural activities from estimations of informal employment rates was done for practical data collection reasons. The institution explained that covering the agricultural sector would require “a considerable expansion of survey operations and increase in costs”.

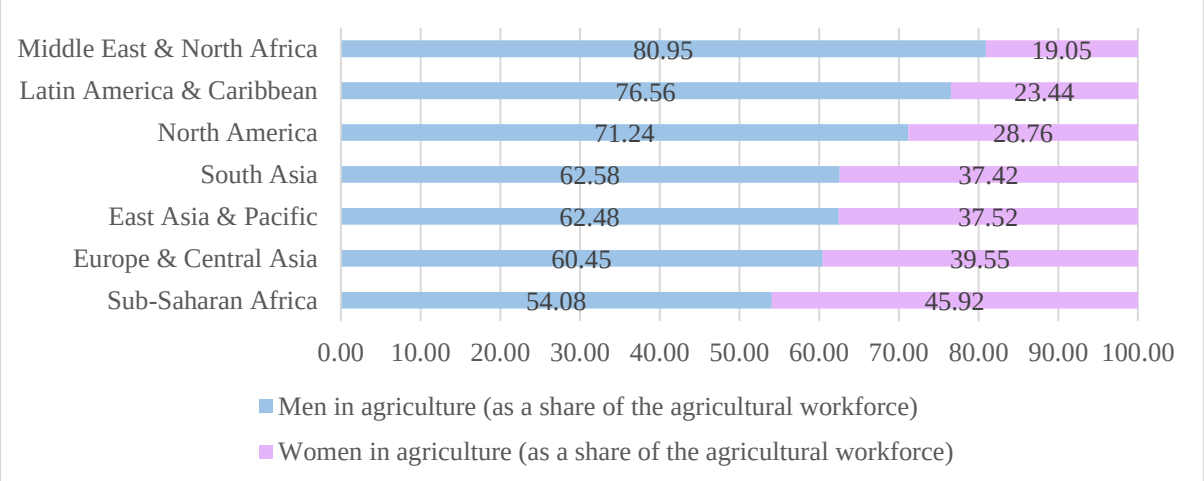
The International Labour Organization (2002) explained that , at the beginning of the 21st century, Mexico, India, and South Africa were among the few countries including the agricultural sector as part of their estimations of informal employment rates. If we consider that most people working in this sector tend to be informal employees, it might seem reasonable

to exclude agricultural activities. Nevertheless, the International Labour Organization recently acknowledged that it was necessary to estimate labour informality without excluding agricultural activities.

ILO (2018) highlighted that the indicator 8.3.1 of the Sustainable Development Goals (SDG) was just measuring the proportion of informal employment in non-agricultural activities. They recommended updating the indicator to capture informal employment across all sectors, including agriculture. Those responsible for the SDGs have confirmed that the indicator has now been updated (Sustainable Development Goals, 2020). The previous SDG indicator was "8.3.1: Proportion of informal employment in non-agricultural employment, by sex". The updated indicator is "8.3.1: Proportion of informal employment in total employment, by sector and sex".

According to The Sustainable Development Goals Report (2021), the global informal employment rate for agricultural activities was 90.7%, while for non-agricultural activities was 48.9%. Nevertheless, researchers have not yet analysed the gender composition of the agricultural workforce across countries. Figure 5 presents estimations of the sex composition of the agricultural workforce using the regional categories established by the World Bank. The figure shows that the agricultural workforce is predominantly male in all regions of the world. The World Bank Data used to obtain these estimations is presented in Table 6, included in the appendix.

Figure 5 – Composition of the agricultural workforce by sex and regions (2022)



Made by the author with data from The World Bank

The chart illustrates effectively the main point of this section. The composition of the agricultural workforce is not gender-balanced, since male workers predominate in this economic sector. Hence, the exclusion of agricultural activities from estimations of informal employment rates across countries results in the omission of some women and several men working informally. This omission skews the estimations of informal employment rates. As a consequence, there are overestimations and misinterpretations about gender disparities in informal labour markets.

This section showed that it is preferable to study gender participation gaps in informal employment using data that includes the agricultural sector. If such estimations are not available, researchers should be aware that the informal employment rates are being underestimated. Furthermore, researchers should clearly state and emphasise that their analysis of informal employment rates is based on incomplete data that is excluding agricultural activities from the estimations.

3 Informal employment rates (including agriculture)

This section presents data on informal employment rates that include the agricultural sector in the estimations. The analysis begins by showing how excluding the agricultural sector has led to consistent overestimations of gender gaps in informal employment rates in Mexico. It then provides evidence refuting the claim that informal employment rates in Latin America are higher for women than for men. Additionally, it offers a comprehensive analysis of the latest estimations of informal employment rates across countries, demonstrating that global informal employment rates are higher for men than for women. This section also documents the reversal of gender gaps in informal labour as part of economic development. The reader will find potential explanations behind this phenomenon that require additional investigation. Finally, it also discusses two additional oversights in the examination of gender participation gaps in informal employment.

3.1 Informal employment rates in Mexico

The International Labour Organization (2002) highlighted that Mexico was one of the few countries that included the agricultural sector in their estimations of informal employment rates since the beginning of the 21st century. Mexico's National Statistical Office, known as INEGI, reports two informal employment rates on a quarterly basis. The first, TIL1 (also known as "tasa de informalidad laboral 1"), shows the informal employment rate across all economic sectors, including agriculture, industry, and services. The second, TIL2 (also known as "tasa de informalidad laboral 2"), presents the labour informality rate excluding the agricultural sector from the estimations.

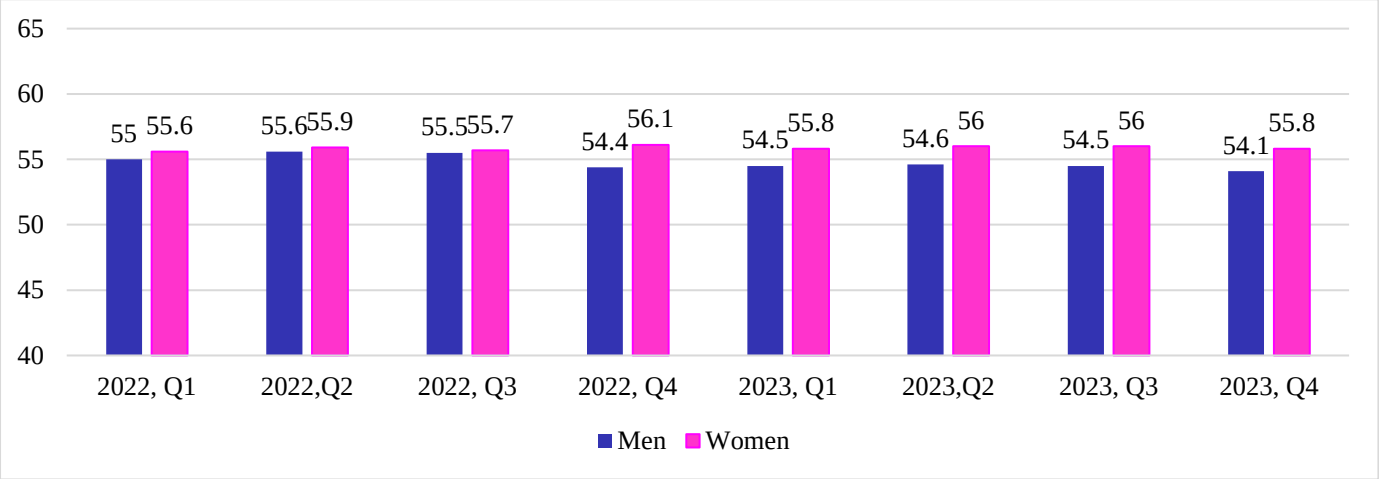
One of the most recognised think tanks in Mexico produces quarterly reports on various economic indicators and labour market statistics. In their reports, they often assert that women have significantly higher informal employment rates compared with men (México ¿Cómo Vamos?; 2023, 2024). For instance, in their analysis of the fourth quarter of 2023, they highlighted that the informal employment rate was higher for women (54.6%) than for men (48.2%). Kaplan (2017), senior labour economist at the Inter-American Development Bank and contributor to the think tank 'Mexico, ¿Cómo Vamos?', noted that this organization always reports the statistics that exclude the agricultural sector (known as TIL2). Nevertheless, the rationale for the decision of using incomplete data that excludes the agricultural sector remains

unclear. Hence, this section will present evidence to emphasise the importance of studying labour informality with data that includes agricultural activities as part of the estimations.

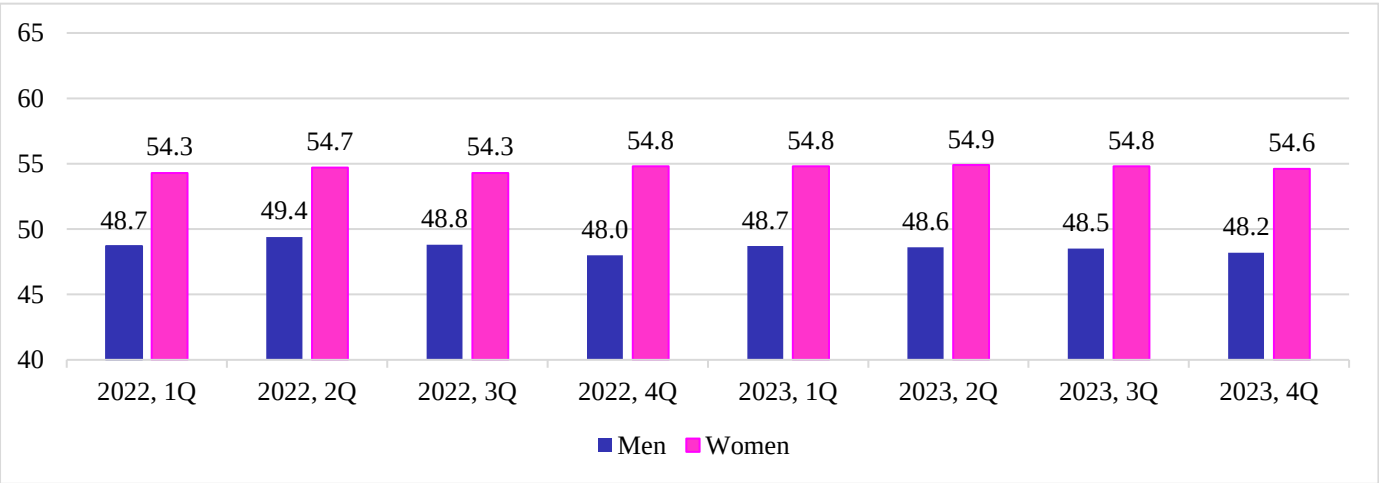
Figure 6 presents a comparison of Mexico's informal employment rates, both including and excluding the agricultural sector. The first chart illustrates that when Mexico's informal employment rates include the agricultural sector (known as TIL1), the gender participation gap is only 1 percentage point on average. Conversely, the second chart shows that when the informal employment rate excludes the agricultural sector (known as TIL2), the gap is around 6 percentage points on average.

Figure 6 – Comparison of informal employment rates in Mexico

(Using TIL1: Including agriculture)



(Using TIL2: Excluding agriculture)



The previous figures illustrate that when the informal employment rate incorporates the agricultural sector in the estimations, there is a significant increase in the informal employment rate for men, whereas the increase for women is marginal. This disparity is attributable to the fact that the majority of Mexico's agricultural workforce comprises men. Table 1 shows that, in 2019, almost 88% of the agricultural workforce in Mexico were men, while around 12% were women.

Table 1 - Share of Mexican men and women in different economic sectors

	Labour force in absolute terms	% of men	% of women
Agricultural workforce	6,939,778	87.60%	12.40%
Industrial workforce	13,864,577	73.50%	26.50%
Service workforce	34,667,375	49.81%	50.19%

The main problem of using incomplete data is that it amplifies the perception of a significant gender participation gap in Mexico's informal labour markets. For instance, the reports from the think tank "Mexico, ¿Cómo Vamos?" have been cited by various media outlets. El Pais (2023), a well-known newspaper, cited a report from the think tank to state that “the informality rate was considerably higher for women (54.8%) than for men (48.5%)”. Reforma (2023), a popular Mexican newspaper, reported that “informality rates were higher for women (54.9%) than for men (48.6%)”. Finally, El Economista (2021), a newspaper specialised in Mexico’s economy, cited a quarterly report from the think tank to claim that in 27 of the 32 Mexican states, the informal employment rates "were higher for women than for men”.

Nevertheless, the media coverage in Mexico on this topic is based on incomplete statistics of informal employment rates. As previously explained, the Mexican think tank consistently reports a gender gap in informal employment rates based on estimations that exclude agricultural activities. Hence, the fourth oversight in the examination of gender participation gaps in informal employment is the failure to specify whether the estimations of informal employment rates include or exclude agricultural activities. In the case of Mexico, this lack of clarity has led to the erroneous conclusion that there is a significant gender gap in informal employment rates.

On the other hand, some readers of this study might argue that, even after including the agricultural sector in the estimations, the informal employment rate in Mexico remains higher for women than for men. This is a valid argument. Figure 6 showed that informal employment rates in Mexico are slightly higher for women even after including agriculture. Nevertheless, it is incorrect to conclude that if informal employment rates are higher for women, then they are over-represented in informal jobs. This research contends that the correct approach to determine if there are more women than men working informally is not by comparing their informal employment rates, but by analysing the gender composition of the informal workforce.

Table 2 shows the distribution of men and women in Mexico's informal workforce. The data indicates that 60% of those employed informally are men, while 40% are women, confirming that Mexican women are not over-represented in informal jobs. A similar trend is observed globally. The International Labour Organization (2018) reported that out of the 2 billion workers in informal employment worldwide, around 740 million were women. Hence, these data challenges the notion that women are the ones that predominate in informal jobs, revealing instead that men constitute the majority of informal workers in Mexico and around the world.

Table 2 - Share of Mexican men and women with different labour status (2019)

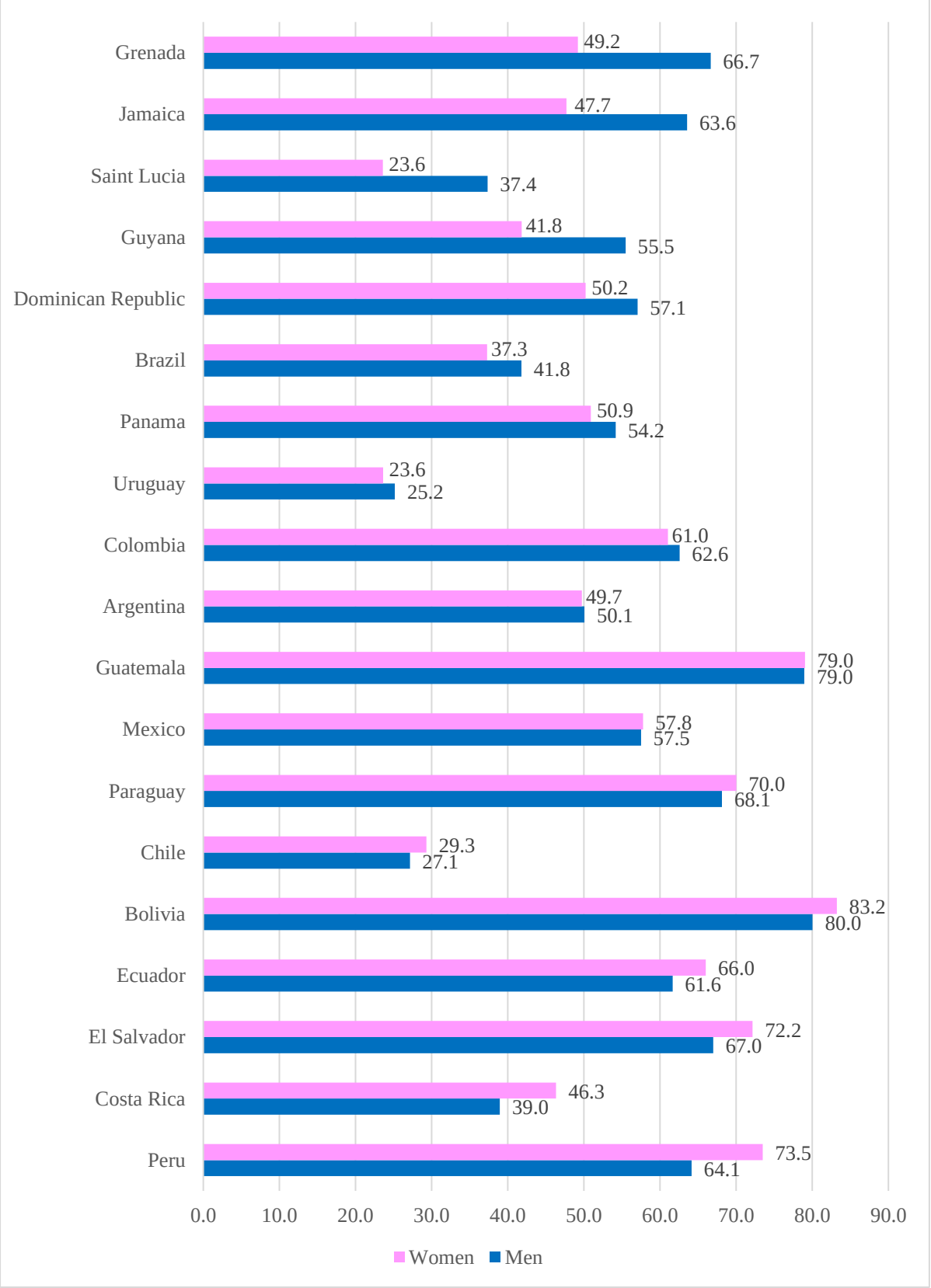
	Labour force in absolute terms	% of men	% of women
Formal workforce	24,305,506	61.72%	38.28%
Informal workforce	31,495,574	59.57%	40.43%
Prime age population (25-55) that is non-economically active	11,979,672	11.42%	88.58%

3.2 Informal employment rates in Latin America

A famous study of gender gaps in labour informality mentioned that, in Latin America, informality rates are higher for women than for men (Berniell *et al*., 2021). The authors reached this conclusion using data from SEDLAC, a research centre based in Argentina. The methodological notes of this dataset do not specify if their estimations of informal employment rates were considering the agricultural sector or not. Nevertheless, the International Labour Organization is now reporting an annual dataset of informal employment rates (including agriculture) across countries. The institution reported statistics on informal employment rates for 91 countries in 2019, 66 countries in 2022, and only 19 countries in 2023. Hence, I used the estimates of 2019 to analyse informal employment rates in Latin American countries, and the data is suggesting a different picture.

Figure 7 shows the informal employment rates (including agriculture) for men and women in 19 Latin American countries during 2019. The data indicates that informal employment rates in Latin American countries are not higher for women. While 8 countries in Latin America are reporting a gender participation gap, 10 of them are showing higher informality rates for men. Hence, these estimates contradict the statement of Berniell *et al*. (2021), as they mentioned that informal employment rates in Latin American countries were higher for women than for men.

Figure 7 – Informal employment rates (including agriculture), by sex in Latin American countries (2019)



3.3 Informal employment rates globally

Some readers could still think that the oversights mentioned in the previous sections might only be happening in Mexico and Latin America. Nevertheless, this section shows that this is a common misconception worldwide. In this section I also present evidence showing different pitfalls made by some international institutions in their reports about labour informality. Additionally, I present global and regional data showing that men have higher informal employment rates compared with women.

A report from the OECD (2019) mentioned that "women are over-represented in the informal workforce in a majority of countries". More recently, the OECD (2023) highlighted that "informal employment is a greater source of employment for women than for men in the following regions: sub-Saharan Africa, Central and Western Asia, Southern Asia and in Northern, Southern and Western Europe and in most low- and lower-middle-income countries". However, the OECD does not specify if they reached this conclusion using estimations of informal employment that are excluding the agricultural sector.

On the other hand, ILO (2012) reported that in 29 out of 41 countries for which data was available, women outnumber men in informal non-agricultural employment. In the previous comparison, ILO specified that their statement is based on estimations of informal employment that are excluding the agricultural sector. Meanwhile, the OECD did not mention this relevant information. This illustrates the importance of specifying if the estimations are including or excluding the agricultural sector.

The Global Gender Gap report by the World Economic Forum (2024) also presented an inaccuracy in its statistics on labour informality. The report provides estimates of informal employment for each country, but incorrectly labels them as "employment in the informal sector". This oversight, previously discussed in other sections, underscores the importance of this study. It appears that there is insufficient coordination among international organizations about how to communicate effectively statistics on labour informality. More specifically, they are not following the recommendations of the International Labour Organization to refer to specific types of informal labour.

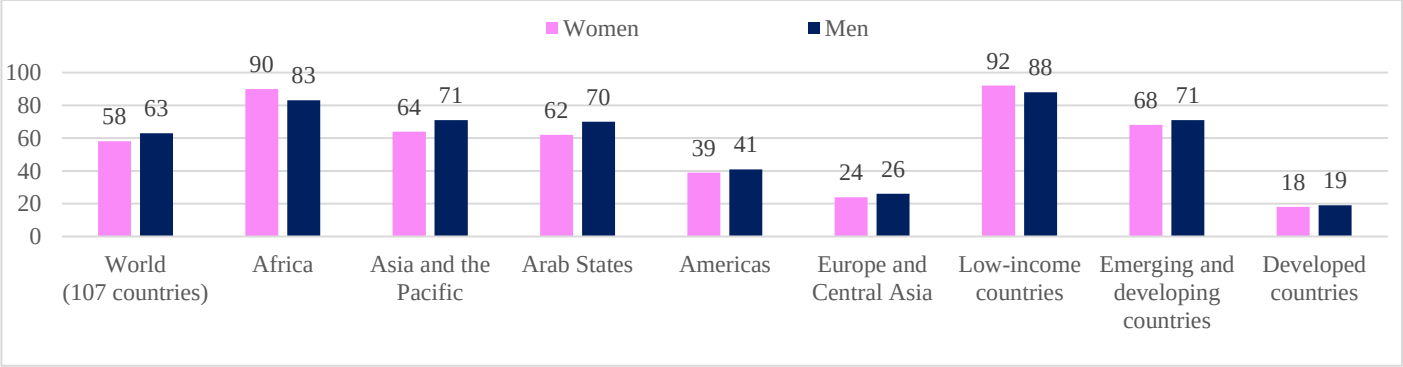
These inconsistencies have contributed to widespread misunderstandings in the interpretation of data about labour informality. Some sources report informality data without mentioning the exclusion of the agricultural sector. Other sources present estimates of informal

employment but label them as estimations of the informal sector. This ambiguity and lack of standardization in the usage of proper terminology leads to inconsistencies and misinterpretations of statistics about labour informality.

I also argue that international institutions and researchers should not be blamed for concluding that there was a gender participation gap in informal employment. As previously discussed, this misconception is largely due to the exclusion of the agricultural sector from informal employment estimates. Media outlets, think tanks, and international organizations concluded that there was a gender participation gap in informality because they did not consider that, by excluding the agricultural sector, a significant percentage of men with informal employment were being overlooked. Hence, this paper highlights the need to point out these oversights to have a better understanding of labour informality across countries.

To conclude this sub-section, I present data from ILO (2018) showing that globally, informal employment rates are higher for men than for women. Figure 8 displays the informal employment rates in different parts of the world. The chart shows that Africa is the only region with higher informal employment rates for women, while in the rest of the regions, informal employment rates are higher for men. Something similar is observed when the countries are categorized by income groups. The low-income countries show a gender participation gap in informal labour, while in middle-income and high-income countries men reported higher informal employment rates. Furthermore, global averages indicate that the informal employment rates stand at 63% for men and 58% for women. This data contradicts the assertion of the OECD (2023), which mention that informal employment was a greater source of employment for women than for men in Central and Western Asia, Southern Asia and in Northern, Southern and Western Europe.

Figure 8 – Share of informal employment in total employment (including agriculture), by sex.



Made by the author with data from ILO (2018)

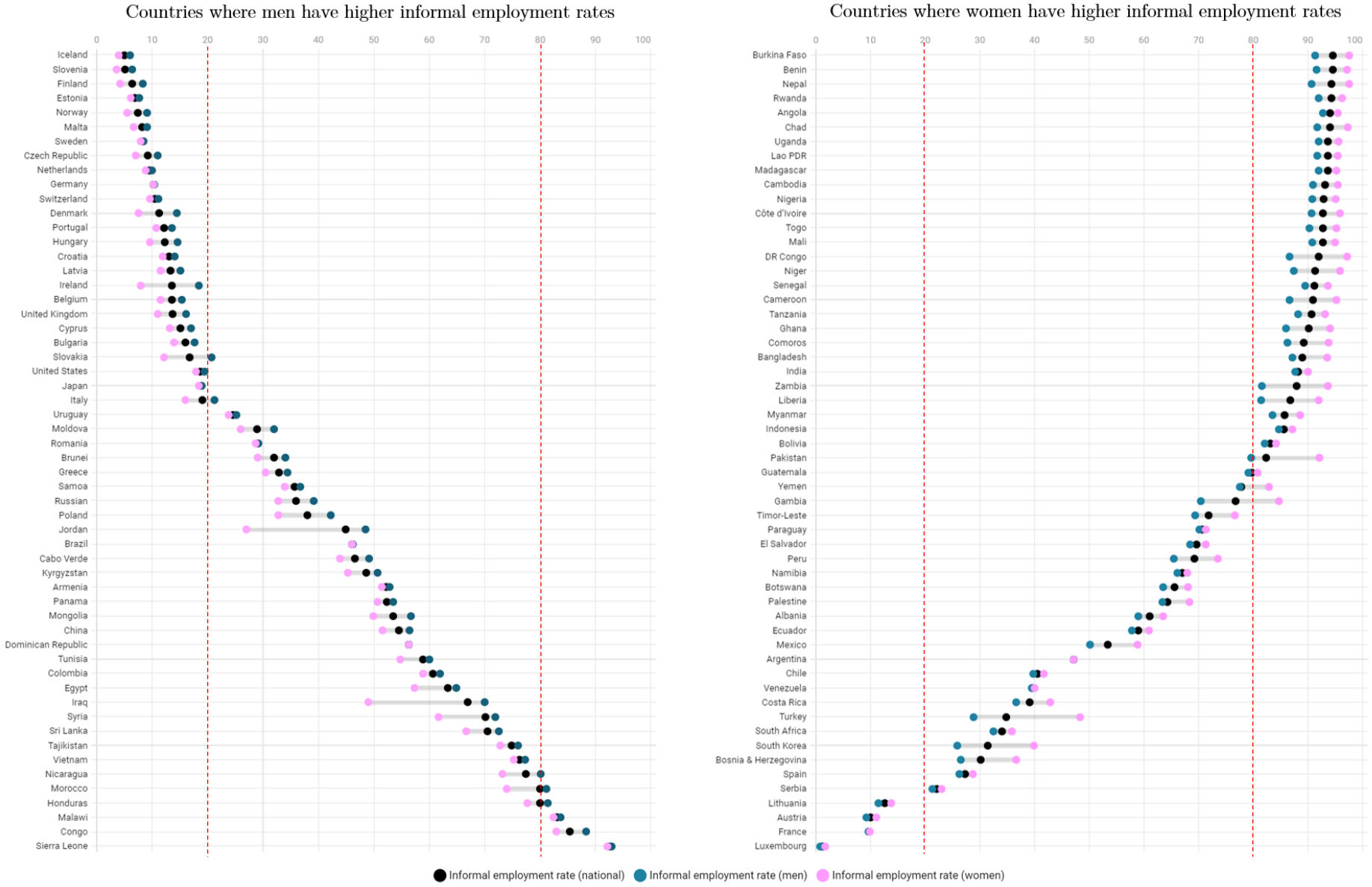
3.4 Informal employment rates across countries

Despite the previous evidence, some studies argue that informal employment rates are higher for women across countries. The OECD (2019) stated that "women are over-represented in the informal workforce in a majority of countries". Gardner, Walsh and Frosch (2022) also mentioned that "in more countries the share of women in informal employment exceeds that of men". Furthermore, Ortiz-Ospina *et al*. (2024) highlighted that in most countries, "women tend to work in the informal economy more often than men" and that "it is likely that this gender difference would be larger if we accounted for the informal agricultural economy, for which data is not available".

New statistics presented by ILO are showing a different picture. ILO (2018) released a report that harmonised micro-datasets of labour statistics from 112 countries, covering nearly 90% of the global workforce. For the first time, this report includes estimations of informal employment rates across countries that are considering not only industry and services, but also agricultural activities. I analysed these data presented by ILO (2018) in Appendix B.1 of the report and found evidence that contradict the previous statements.

Figure 9 presents the cross-country analysis of informal employment rates that include agriculture as part of the estimations. The initial takeaway of this figure is that half of the countries are reporting higher informal employment rates for men. This leads to the conclusion that, once agriculture is considered, women do not have higher informal employment rates across countries. Although this is relevant finding, there is another interesting trend that emerged from this analysis. The chart on the left side shows that most countries with low informal employment rates (20% or less), tend to exhibit higher informal employment rates for men. In contrast, the chart on the right side shows that countries with high informal employment rates (80% or more) are consistently reporting higher informal employment rates for women.

Figure 9 – The reversal of gender gaps in informal employment rates across countries



Based on this evidence, I argue that this pattern could be related to the fact that these countries are at the earliest and latest stages of economic development. For instance, countries where at least 80% of the workforce is informal are also among the less developed countries worldwide. At this stage of economic development, formal jobs are scarce and are typically reserved for men (i.e. government positions). In this economic context women have little chances of participating in formal economic activities. Consequently, working women living in these countries are showing a consistent pattern of higher informality rates compared with working men.

The opposite occurs in countries where at least 80% of the workforce is formal. In this economic context, working men report higher informal employment rates for several reasons. First, because countries with low informal employment rates are among the most developed economies. In this scenario, men and women tend to have the highest education levels worldwide while there is abundant labour demand from formal enterprises. Hence, lots of women will find formal jobs, especially in the service sector. Nevertheless, those who do not find one will often prefer not to work or just keep looking rather than taking informal jobs. Similarly, most men in these countries will also secure formal jobs, but those who do not find one are more likely to pursue any income-generating activities, even if it is informal. As a result, working men in these countries are reporting higher informality rates compared with working women of the same country.

The World Bank (2022) found a similar pattern after analysing vulnerable work conditions across countries. Vulnerable jobs, which includes self-employment and family workers, are characterized by low incomes and poor job security. Countries with the highest rates of vulnerable jobs tend to be low-income economies with a large agricultural sector. In this context, women tend to make up the higher share of the vulnerably employed. Conversely, in high-income economies with fewer vulnerable jobs, men are the most likely to fill these positions. Hence, they also reported a flip on gender gaps based on the country's level economic development.

Coming back to the analysis of informal employment rates across countries, it is a bit more challenging to identify patterns among countries with intermediate levels of informal labour. In this economic context, there is no predominance of formal nor informal activities. Instead, these countries have dual labour markets where formal and informal coexist. One potential factor that might be determining if the informal employment rates are higher for

women or men is the societal attitudes towards female labour participation. If there are strong negative attitudes towards women working in informal activities, informality rates will be higher for men. Conversely, in countries with dual labour markets and higher informality rates for women, it is likely that there are positive or neutral attitudes towards women working in informal jobs.

Another potential explanation to understand the dynamics of gender gaps in countries with intermediate levels of labour informality hinges on the roles that these countries play in international trade and the global division of labour. If a country specialised in industrial activities where women predominate, such as the textile sector, there is a higher chance that women will report higher informal employment rates than men. Conversely, if a country has diversified their exports or they have specialised in industrial activities where men predominate, the country will probably report a higher informality among men.

Beyond the previous hypotheses, several key aspects of the statistics reported by ILO (2018) should be highlighted. First, they mention that their estimates of informal employment were estimated using microdata from household surveys conducted by each of the countries included in their report. Nevertheless, they clarified that the informal employment rate in their report were calculated with data from different years. In most of the cases, estimations were derived from household surveys conducted between 2010 and 2016. For instance, Mexico's informal employment rates were estimated with the 2015 National Occupation and Employment Survey (ENOE), while data for Argentina and Brazil were taken from surveys conducted in 2016.

It is important to emphasise that it has been a major challenge for ILO to obtain comparable data of informal employment rates across countries. Gardner *et al*. (2022) mentioned that in 2002, there were only 25 countries with available data of informal employment rates. A few years later, in 2018, ILO reported data of informal employment rates (including agriculture) for 112 countries. Nevertheless, there are still many countries that are not part of the current global estimate. Countries like Ethiopia, Philippines, Iran, Thailand, Kenya, Sudan, Algeria, and Canada are not part of the statistics although they are highly populated. Hence, the reader should consider that even when current data is showing that half of the countries are showing higher informality rates for men, this balance will probably change when more countries are included in the estimations of informal employment rates across countries.

It is also worth noting that ILO (2018) mentions in their report that they estimated informal employment rates for 119 countries. Nevertheless, they also mentioned that the estimations of seven countries were done separately, while the other 112 countries are the ones included in this analysis. Unfortunately, the data of the other seven countries was not included in the appendix of the report. Hence, my analysis is based on the data of 112 countries.

The International Labour Organization (2023) presented an statistical update about men and women in the informal economy. They explained that informal employment rates are higher for men (60%) than for women (55%) worldwide. On the other hand, they mentioned that in 56% of the countries included in their analysis, women show higher informal employment rates than men. Based on this data, they highlighted that “in the majority of countries the share of women in informal employment exceeds that of men”. Unfortunately, the report does not provide the statistics of the countries that were considered to reach this conclusion.

The report’s assertion that the share of women in informal employment is higher in the "majority" of countries is inaccurate and appears somewhat overstated. Based on conventional thresholds for defining a "majority", such a conclusion would typically require at least 66% or 75% of the countries exhibiting higher informal employment rates among women. Thus, I contend that this interpretation may be misleading, as it implies a disproportionate picture than the data likely supports. Hence, a more precise conclusion would be that there are slightly more countries where women have higher informal employment rates compared to men, rather than implying a dominant majority. This distinction is critical, as sloppiness in the interpretation of statistics can lead to broader misconceptions, which this paper seeks to clarify.

Besides this point, my previous argument is reinforced after this discussion. The cross-country analysis of gender participation gaps in informal employment indicates that 56 countries are reporting higher informal employment rates for men, while the other 56 countries are reporting higher informality rates among women. Nevertheless, this current balance of gender participation gaps in informal employment rates across countries can easily become slightly unbalanced as more countries are included in the estimations. If this occurs, it is crucial to refrain from making overstatements.

4 Data and empirical model

One of the most common assertions in the literature of gender participation gaps in informal labour is that women are more likely to have an informal job compared with men. The OECD (2012) stated "that women are more likely than men to work informally". Losby *et al*. (2002) also mentioned "that women are more likely than men to work informally". McCaig & Pavcnik (2015) highlighted that "women are more likely to work in the informal sector". Finally, Malta et al. (2019) concluded "that women are more likely to be in the informal sector than men".

This section includes a detailed explanation of the methodology that was followed to evaluate if women are more likely than men to have an informal employment. The section starts with insights about the dataset. Then it presents a concise explanation of the econometric model and the variables that were included in the regression analysis. The section concludes by presenting the descriptive statistics.

The database used for the regression analysis is Mexico's ENOE household survey. The National Statistical Office, known as INEGI, is responsible for conducting this survey, which serves as the primary source of labour statistics for the country. The analysis is based on a survey collected during the fourth quarter of 2019, just before the onset of the COVID-19 pandemic. I decided not to consider surveys collected during 2020 nor 2021 to avoid distortions in the results, as female labour force participation was significantly impacted during the COVID pandemic.

This study presents three different approaches to estimate the likelihood of working informally for both men and women. To do so, the regression analysis is based on probit regressions that can be expressed with the following equation:

$$P(Y_i) = \mathrm{F}\left(\beta_0 + \beta_1 Female_{it} + \sum_j^4 \beta_x I_i^{(j)} + \sum_j^5 \beta_x H_i^{(j)} + \sum_j^3 \beta_x HH_i^{(j)} + \mu_e + \varepsilon_i\right), \quad (1)$$

Where 'Y' represents the dependent variable of the econometric model. The first dependent variable employed in the regression analysis considers the working-age population, meaning those individuals between 18 to 65 years. Hence, this dependent variable takes a value of 1 if the individual works informally, and 0 if they are not working, or if they are working formally. This study argues that this is the correct approach to empirically evaluate this

hypothesis, as this is the only way in which the results can be generalized to the working-age population.

The second regression considers a dependent variable that takes value of 1 if the respondents have and informal job and 0 if they have a formal job. Hence, the second regression is excluding the non-working population from the sample. This is the approach followed by Malta *et al*. (2019) to evaluate the likelihood that men and women in Senegal were working informally. This study argues that if researchers decide to examine the likelihood of working informally using this approach, the results cannot be generalized to the entire working-age population. Instead, the results should specify that only the working population was considered in the analysis.

Lastly, the third dependent variable employed in this regression analysis takes a value of 1 if the individual has a non-agricultural informal job, and 0 if they have a non-agricultural formal job. Hence, the third dependent variable is excluding not only those that are not working, but also those that have a job in the agricultural sector. This study highlights that following this approach may be inappropriate since both the non-working population and the agricultural workforce are excluded from the analysis.

The main independent variable of the model is *"Female"*, a binary variable that takes a value of 1 if the respondent is a woman, and 0 if it is a man. β_1 is the coefficient of interest throughout the paper, as the coefficients will capture the positive or negative relationship of women having an informal job compared with men.

'I' is a vector of four explanatory variables that control for individual characteristics of each respondent in the sample. 'Age' and 'age squared' are included in this vector to capture the linear and non-linear relationship of having different labour statuses at various stages of life. 'Marital status' is a categorical variable that captures if the survey respondent is single, married, unmarried with a permanent partner, divorced, separated, or widowed. Finally, 'Education' captures the highest level of education achieved by each person in the sample. This control variable can take the following values: 0) no studies at all, 1) primary school, 2) secondary school, 3) high school, 4) technical career, and 5) graduate or postgraduate degree.

'H' is a vector of five explanatory variables controlling for household characteristics. 'Socioeconomic stratum' is a categorical variable that captures the households' economic situation. INEGI (2020) explained that the categories are defined after considering 34

indicators that capture the physical characteristics, assets, and equipment in each household. It takes the following values: 1) low strata, 2) medium-low strata, 3) medium-high strata, 4) high strata. Moreover, ‘urban’ takes a value of 1 if the household is located in an urban area and 0 if it is in a rural area. ‘Population size’ is a categorical variable that shows if the household is in a densely populated area or not. It takes the following values: 1) More than 100,000 inhabitants, 2) Between 15,000 and 99,999 inhabitants, 3) Between 2,500 and 14,000 inhabitants and 4) Less than 2,500 inhabitants. ‘Members’ is a continuous variable capturing the total number of people living in the household. ‘Kids’ is a continuous variable that captures the total number of children in the household below 5 years old.

Finally, ‘HH’ is a vector that controls for three characteristics of the household head: age, sex, and level of education. The descriptive statistics of the different variables used for the regression analyses are presented in the following table.

Table 3 - Descriptive statistics

	All						Women						Men					
	Obs.	%	Mean	Std. Dev.	Min	Max	Obs.	%	Mean	Std. Dev.	Min	Max	Obs.	%	Mean	Std. Dev.	Min	Max
Dependent variable																		
Informality (Considering working-age population)	246,778	-	0.328	0.469	0	1	129,731	-	0.271	0.444	0	1	117,047	-	0.391	0.488	0	1
Informality (Excluding non-working population)	165,715	-	0.488	0.500	0	1	68,834	-	0.510	0.500	0	1	96,881	-	0.472	0.499	0	1
Informality (Excluding non-workers and agriculture)	152,656	-	0.457	0.498	0	1	66,949	-	0.501	0.500	0	1	85,707	-	0.424	0.494	0	1
Independent variables																		
Female	246,778	-	0.5257	0.499	0	1	-	-	-	-	-	-	-	-	-	-	-	-
Age	246,778	-	38.631	13.438	18	65	129,731		38.991	13.417	18	65	117,047	-	38.232	13.450	18	65
Urban location	246,778	-	0.650	0.477	0	1	129,731	-	0.650	0.477	0	1	117,047	-	0.650	0.477	0	1
Kids in the household	246,778	-	0.371	0.654	0	4	129,731	-	0.393	0.669	0	4	117,047	-	0.347	0.637	0	4
Household members	246,778	-	4.302	1.860	1	11	129,731	-	4.328	1.855	1	11	117,047	-	4.273	1.866	1	11
Household head: Age	246,778	-	49.183	13.503	15	98	129,731	-	49.472	13.569	15	98	117,047	-	48.862	13.422	15	98
Household head: Female	246,778	-	0.266	0.442	0	1	129,731	-	0.332	0.471	0	1	117,047	-	0.193	0.395	0	1
Marital status																		
Free union	44,936	18.21	-	-	-	-	23,015	17.74	-	-	-	-	21,921	18.73	-	-	-	-
Separated	11,040	4.47	-	-	-	-	7,224	5.57	-	-	-	-	3,816	3.26	-	-	-	-
Divorced	5,155	2.09	-	-	-	-	3,454	2.66	-	-	-	-	1,701	1.45	-	-	-	-
Widowed	5,651	2.29	-	-	-	-	4,674	3.6	-	-	-	-	977	0.83	-	-	-	-
Married	104,926	42.52	-	-	-	-	54,780	42.23	-	-	-	-	50,146	42.84	-	-	-	-
Single	75,049	30.41	-	-	-	-	36,574	28.19	-	-	-	-	38,475	32.87	-	-	-	-
Missing values	21	0.01	-	-	-	-	10	0.01	-	-	-	-	11	0.01	-	-	-	-
Level of education																		
No studies	6,299	2.55	-	-	-	-	3,585	2.76	-	-	-	-	2,714	2.32	-	-	-	-

Primary school	43,237	17.52	-	-	-	-	23,263	17.93	-	-	-	-	19,974	17.06	-	-	-	-
Secondary school	68,629	27.81	-	-	-	-	36,238	27.93	-	-	-	-	32,391	27.67	-	-	-	-
High school	57,862	23.45	-	-	-	-	28,405	21.9	-	-	-	-	29,457	25.17	-	-	-	-
Technical career	10,495	4.25	-	-	-	-	7,408	5.71	-	-	-	-	3,087	2.64	-	-	-	-
Graduate or post-graduate	60,085	24.35	-	-	-	-	30,763	23.71	-	-	-	-	29,322	25.05	-	-	-	-
Missing values	171	0.07	-	-	-	-	69	0.05	-	-	-	-	102	0.09	-	-	-	-
Socioeconomic strata																		
Low	28,281	11.46	-	-	-	-	14,856	11.45	-	-	-	-	13,425	11.47	-	-	-	-
Medium-low	123,261	49.95	-	-	-	-	64,527	49.74	-	-	-	-	58,734	50.18	-	-	-	-
Medium-high	66,066	26.77	-	-	-	-	34,872	26.88	-	-	-	-	31,194	26.65	-	-	-	-
High	29,170	11.82	-	-	-	-	15,476	11.93	-	-	-	-	13,694	11.7	-	-	-	-
Population size																		
More than 100,000 inhabitants	151,281	61.30	-	-	-	-	79,441	61.24	-	-	-	-	71,840	61.38	-	-	-	-
Between 15,000 and 99,999	32,241	13.06	-	-	-	-	17,019	13.12	-	-	-	-	15,222	13.01	-	-	-	-
Between 2,500 and 14,999	29,895	12.11	-	-	-	-	15,802	12.18	-	-	-	-	14,093	12.04	-	-	-	-
Less than 2,500 inhabitants	33,361	13.52	-	-	-	-	17,469	13.47	-	-	-	-	15,892	13.58	-	-	-	-
Household head education																		
No studies	10,623	4.30	-	-	-	-	5,528	4.26	-	-	-	-	5,095	4.35	-	-	-	-
Primary school	65,442	26.52	-	-	-	-	34,680	26.73	-	-	-	-	30,762	26.28	-	-	-	-
Secondary school	69,013	27.97	-	-	-	-	36,111	27.84	-	-	-	-	32,902	28.11	-	-	-	-
High school	42,000	17.02	-	-	-	-	21,609	16.66	-	-	-	-	20,391	17.42	-	-	-	-
Technical career	11,260	4.56	-	-	-	-	6,392	4.93	-	-	-	-	4,868	4.16	-	-	-	-
Graduate or post-graduate	48,254	19.55	-	-	-	-	25,316	19.51	-	-	-	-	22,938	19.6	-	-	-	-
Missing values	186	0.08	-	-	-	-	95	0.07	-	-	-	-	91	0.08	-	-	-	-
Mexican states																		
Aguascalientes	7,057	2.86	-	-	-	-	3,705	2.86	-	-	-	-	3,352	2.86	-	-	-	-
Baja California	10,132	4.11	-	-	-	-	5,128	3.95	-	-	-	-	5,004	4.28	-	-	-	-
Baja California Sur	5,392	2.18	-	-	-	-	2,688	2.07	-	-	-	-	2,704	2.31	-	-	-	-
Campeche	7,022	2.85	-	-	-	-	3,743	2.89	-	-	-	-	3,279	2.8	-	-	-	-

Coahuila	10,260	4.16	-	-	-	-	5,323	4.1	-	-	-	-	4,937	4.22	-	-	-	-
Colima	6,224	2.52	-	-	-	-	3,259	2.51	-	-	-	-	2,965	2.53	-	-	-	-
Chiapas	8,260	3.35	-	-	-	-	4,503	3.47	-	-	-	-	3,757	3.21	-	-	-	-
Chihuahua	9,405	3.81	-	-	-	-	4,846	3.74	-	-	-	-	4,559	3.9	-	-	-	-
Mexico City	6,172	2.5	-	-	-	-	3,258	2.51	-	-	-	-	2,914	2.49	-	-	-	-
Durango	8,013	3.25	-	-	-	-	4,168	3.21	-	-	-	-	3,845	3.29	-	-	-	-
Guanajuato	10,120	4.1	-	-	-	-	5,338	4.11	-	-	-	-	4,782	4.09	-	-	-	-
Guerrero	6,972	2.83	-	-	-	-	3,759	2.9	-	-	-	-	3,213	2.75	-	-	-	-
Hidalgo	6,423	2.6	-	-	-	-	3,476	2.68	-	-	-	-	2,947	2.52	-	-	-	-
Jalisco	8,486	3.44	-	-	-	-	4,390	3.38	-	-	-	-	4,096	3.5	-	-	-	-
Estado de México	11,104	4.5	-	-	-	-	5,819	4.49	-	-	-	-	5,285	4.52	-	-	-	-
Michoacán	7,162	2.9	-	-	-	-	3,795	2.93	-	-	-	-	3,367	2.88	-	-	-	-
Morelos	6,447	2.61	-	-	-	-	3,512	2.71	-	-	-	-	2,935	2.51	-	-	-	-
Nayarit	6,742	2.73	-	-	-	-	3,558	2.74	-	-	-	-	3,184	2.72	-	-	-	-
Nuevo Leon	8,277	3.35	-	-	-	-	4,180	3.22	-	-	-	-	4,097	3.5	-	-	-	-
Oaxaca	7,863	3.19	-	-	-	-	4,356	3.36	-	-	-	-	3,507	3	-	-	-	-
Puebla	8,908	3.61	-	-	-	-	4,802	3.7	-	-	-	-	4,106	3.51	-	-	-	-
Querétaro	7,119	2.88	-	-	-	-	3,733	2.88	-	-	-	-	3,386	2.89	-	-	-	-
Quintana Roo	6,322	2.56	-	-	-	-	3,199	2.47	-	-	-	-	3,123	2.67	-	-	-	-
San Luis Potosi	7,157	2.9	-	-	-	-	3,783	2.92	-	-	-	-	3,374	2.88	-	-	-	-
Sinaloa	7,235	2.93	-	-	-	-	3,744	2.89	-	-	-	-	3,491	2.98	-	-	-	-
Sonora	6,570	2.66	-	-	-	-	3,345	2.58	-	-	-	-	3,225	2.76	-	-	-	-
Tabasco	7,090	2.87	-	-	-	-	3,742	2.88	-	-	-	-	3,348	2.86	-	-	-	-
Tamaulipas	9,630	3.9	-	-	-	-	5,024	3.87	-	-	-	-	4,606	3.94	-	-	-	-
Tlaxcala	7,116	2.88	-	-	-	-	3,819	2.94	-	-	-	-	3,297	2.82	-	-	-	-
Veracruz	7,752	3.14	-	-	-	-	4,187	3.23	-	-	-	-	3,565	3.05	-	-	-	-
Yucatán	6,997	2.84	-	-	-	-	3,637	2.8	-	-	-	-	3,360	2.87	-	-	-	-
Zacatecas	7,349	2.98	-	-	-	-	3,912	3.02	-	-	-	-	3,437	2.94	-	-	-	-

5 Results

Are women more likely to work in informal jobs compared with men? This section presents the results derived from evaluating this hypothesis in Mexico's labour markets. In this section the reader will also find an explanation of the sixth oversight in the literature on gender participation gaps in informal employment.

As previously explained, this research uses various dependent variables to test the hypothesis that women are more likely than men to work informally. Table 4 presents the results obtained from the regression analysis. The first column in the regression table is based on a dependent variable that considers the entire working-age population in Mexico (18-65 years). This is a binary variable that takes value of 1 if the individual is working informally and 0 if they are either working formally or not working. The results show a negative and statistically significant coefficient for women. Hence the regression analysis is reporting that women are less likely to have informal jobs compared with men. This finding aligns with the fact that 60% of the informal workforce in Mexico consists of men, while 40% are women.

The second column in Table 4 presents the result obtained based on a dependent variable that is excluding the non-working population from the regression analysis. In this case, the dependent variable is a binary variable that takes value of 1 if the respondent works informally and 0 if they work formally. The results show a positive and statistically significant coefficient for women. Therefore, the results are indicating that working women in Mexico are more likely to have informal jobs compared with working men. This result is consistent with previously presented data, showing that informal employment rates in Mexico are slightly higher for women than for men, even after including agricultural activities.

These differing results may seem counterintuitive to some readers. Therefore, it is essential to clarify the factors contributing to the outcomes of the first and second regressions. In the first regression, the coefficient for women is negative, whereas in the second regression, it is positive. This discrepancy arises because the first regression includes the entire working-age population, regardless of employment status, whereas the second regression considers only the working population. Consequently, the regression results report a shift in the women's coefficient from negative to positive.

These results underscore a critical oversight in the literature about gender participation gaps in informal employment. To accurately assess whether men or women are more likely to work informally, researchers should include the entire working-age population in their analysis. If the focus is solely on the working population and the results show a positive coefficient for women, the correct conclusion is that *working women* are more likely to hold informal jobs compared with *working men*. If the regression is limited to the working population, the findings must be interpreted within that context. Excluding the non-working population means the results cannot be generalized to the entire working-age population. Therefore, this research highlights the importance of avoiding sloppiness and advocates for a careful interpretation of results based on the scope of the population that is being studied.

Malta *et al*. (2019) made this oversight in their study on informal employment in Senegal. They concluded that Senegalese women were more likely to work informally than men. However, their analysis was just considering the employed population. Hence, there is a misinterpretation in the regression results. The correct interpretation should have been that *working women* in Senegal are more likely to have informal jobs compared with *working men*. Instead, the researchers generalized these results to the entire working-age population.

The argument about correctly interpreting regression results may seem fussy or overly meticulous to some readers. Nevertheless, it is important to emphasise that the literature in this area often generalises findings based on an incorrect interpretation of labour statistics. For example, Malta *et al*. (2019) noted that in Africa, women have higher informal employment rates than men. Although this is true, they used this argument to conclude that in most countries in sub-Saharan Africa women are disproportionately over-represented in the informal economy. Nevertheless, previous sections of this paper explained that even if women have higher informal employment rates than men, this does not imply that they are over-represented in informal activities.

To illustrate the last point, consider the case of Mexico. In 2019, the informal employment rate (including agriculture) was higher for Mexican women than for Mexican men. However, the gender composition of the informal labour force in Mexico during that year indicates that 60% of informal workers were men, while 40% were women. Therefore, in Mexico, while working women have higher informal employment rates than working men, there is also a greater number of men working informally. Thus, this paper argues that it is not

accurate to claim that women are over-represented in informal jobs based on comparisons of informal employment rates.

Following the same logic, it is not possible to conclude that women are more likely to work informally than men if the researcher excludes the non-working population. Therefore, if the regression analysis does not consider the entire working-age population, the results should not be generalized to the entire working-age population. This methodological oversight has led some researchers and international organizations to support the claim that women are more likely to have informal jobs than men, even when there are more men working informally, not only in Mexico but globally.

Therefore, the results of this paper indicate that Mexican men are more likely to work informally than Mexican women. This is understandable if we consider that in Mexico there are more men working informally than women. In contrast, the results are also indicating that *working women* are more likely to have informal jobs compared with *working men.* These results are understandable if we consider that working women in Mexico report slightly higher informal employment rates than working men in Mexico. Thus, this regression analysis underscores the importance of contextualizing and interpreting the results appropriately. The shift in the regression coefficient from negative to positive indicates that the likelihood of men and women working informally varies depending on whether the non-working population is included or excluded from the analysis.

I argue that in most countries, men will be more likely to work informally compared with women if the working-age population is considered. On the other hand, if only the working population is analysed, the results will vary depending on the country that is being analysed. In countries where men have higher informal employment rates, working men will generally be more likely to hold informal jobs than working women. Conversely, in countries like Mexico, where informal employment rates are higher among women, working women will be more likely to have informal jobs than their male counterparts.

Finally, the third regression in Table 4 uses a dependent variable that omits both the non-working population and agricultural activities. Hence, this variable takes a value of 1 if the respondent works informally in non-agricultural jobs and 0 if they work formally in non-agricultural jobs. The results show a negative and statistically significant coefficient for women, which is larger compared with the results of the second regression. As previously

explained, Mexico's agricultural workforce is 88% men and 12% women. Thus, when agricultural activities are excluded, a significant number of men are dropped from the sample, while only a few women are removed. As a result, the regression analysis over-estimates the results and shows a bigger negative coefficient for working women.

The results of this regression analysis have illustrated the importance of accurately defining the scope of empirical evaluation and correctly interpreting the results. Previous studies on gender participation gaps in informal activities have often focused on the working population rather than the entire working-age population. Following this approach has led to the incorrect generalization that women are more likely to work informally than men across the entire population. Nonetheless, the regression analysis showed that results will depend on the sample specification.

Table 4 - Regression results: Likelihood of having an informal job

	Considering working-age population	Excluding non-working population	Excluding non-workers and agricultural jobs
	(1)	(2)	(3)
Women	-0.4747***	0.2071***	0.2635***
(Compared with men)	(0.0086)	(0.0110)	(0.0114)
Control variables			
Age	✓	✓	✓
Age squared	✓	✓	✓
Education	✓	✓	✓
Marital Status	✓	✓	✓
Socioeconomic stratum	✓	✓	✓
Urban location	✓	✓	✓
Population size	✓	✓	✓
Kids in the household	✓	✓	✓
Household members	✓	✓	✓
Household head age	✓	✓	✓
Household head sex	✓	✓	✓
Household head education	✓	✓	✓
State fixed effects	✓	✓	✓
Constant	-0.2435***	2.6571***	2.4990***
	(0.0631)	(0.0854)	(0.0935)
Observations	246,476	165,507	152,470

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

6 Discussion

The assertions made in this research may be controversial for some readers. Therefore, it is pertinent to provide an example to help readers view this analysis more objectively. Consider a scenario where a group of researchers determine that the appropriate method for studying labour informality is by considering only those individuals getting incomes or earnings from their informal work. This approach would exclude numerous women working in family businesses without receiving a salary, thereby rendering their contributions invisible. Furthermore, imagine that the result of that research is generalized to the entire population, without clearly and emphatically specifying that they are focusing solely on informal paid employment.

Similarly, excluding agricultural activities from estimates of informal employment rates renders the work of many men in this sector invisible. According to World Bank Data, 26% of the global labour force was working in agriculture during 2022. The fact that large numbers of male workers in agriculture are receiving a salary for their informal work should not be considered less relevant than the fact that large numbers of women are not receiving any income when they work in family businesses. Many agricultural workers also face precarious labour conditions, such as daily wage payments and no compensation if they fall ill or are injured. Therefore, this research contends that it is essential to include all forms of labour informality in estimates of informal employment rates. Doing so is the first step toward gaining a deeper understanding of how this heterogeneous phenomenon affects men and women differently.

7 Conclusions

This research challenges claims about gender participation gaps in informal employment by presenting evidence that reshapes our understanding on this topic. Contrary to the widespread notion that women are over-represented in informal jobs, the analysis shows that men constitute the majority of the informal workforce, both in Mexico and globally. Estimates show that men constitute 60% of the informal workforce in Mexico, and this figure rises to 63% globally. Hence, this paper highlights that men are the ones that predominate in informal labour markets.

This paper also highlights that excluding the agricultural sector from informal employment estimates has led to misleading conclusions about gender participation gaps in informal labour markets. Using Mexico as a case study, the paper shows that gender disparities are overestimated when agriculture is omitted, as men overwhelmingly dominate this sector. For instance, men comprise 88% of the Mexican agricultural workforce, while women make up only 12%. Moreover, men are shown to predominate in the agricultural sector across all other regions of the world. Thus, excluding agriculture considerably underestimates male informal employment rates and distorts interpretations of gender participation gaps in informal labour markets. For instance, a brief analysis using data from Mexico shows that when non-agricultural estimations are considered, there is a gender participation gap of 8 percentage points on average. Nevertheless, this gender participation gap in Mexico narrowed to just 1 percentage point once agriculture is included in the estimates.

Furthermore, although it was previously believed that women have higher informal employment rates across countries, this paper presents new data revealing a more balanced picture. First, the paper examined 19 Latin American countries that have estimations of informal employment including the agricultural sector. The analysis reveals that 10 of these countries report higher informality rates for men. Additionally, this paper analyses data from 112 countries that estimate informal employment rates across agriculture, industry, and services. The cross-country analysis indicates that informal employment rates are higher for men than for women in half of these countries.

The cross-country analysis revealed another interesting pattern: the reversal of gender gaps in informal labour. In highly informal countries women reported higher informal employment rates compared with men. Conversely, in low-informal, men reported higher informality rates than women. The paper considers that this trend might be related to the fact

these countries are at the initial and final stage of economic development. For instance, in those countries where informality predominate, the few formal jobs available in their labour markets are mostly reserved for men. Consequently, a gender gap in informality emerges in this economic context. Meanwhile, in countries with low informality rates, most men and women already have access to formal employment. Nevertheless, among those that do not have formal job, I argue that most men will be compelled to engage in any kind of income-generating activities. Conversely, many women will decide to keep looking for a job or even not working rather than working informally. As a result, men are consistently reporting higher informal employment rates in countries with low informality.

Finally, a regression analysis based on data from Mexico demonstrates that men are more likely to hold informal jobs compared with women. This is understandable if we consider that men represent 60% of the informal workforce in Mexico. On the other hand, the results also showed that working women in Mexico are more likely to have an informal job compared with working men. This is understandable if we consider that working women in Mexico have slightly higher informal employment rates than working men. Based on these counter-intuitive results, the study argues that researchers examining labour informality need to clearly specify if their results were just considering the working population. If this is the case, the results cannot be generalized to the entire working-age population.

The paper also discusses the WIEGO pyramid model, which argues that at the top of informal labour markets are the informal employers, who have the highest earnings and tend to be men. Meanwhile, at the bottom of the pyramid are the unpaid family employees, who do not receive any income and are typically women. By analysing data from Mexico, I assess the validity of this theory and confirm its accuracy. The analysis shows that in Mexico there are more women working as unpaid family workers than men. While among those working as informal employers, the majority are men. Hence, this paper confirms that women are the ones that predominate as unpaid family workers, which is considered the most vulnerable position among the different types of informal labour.

On the other hand, I also explain that validating the WIEGO hierarchical model of informal labour in Mexico, or in other countries, should not be misinterpreted nor used to conclude that women are over-represented in informal jobs, as that is separate and distinct assertion. As previously explained, the data indicates that there are more men than women working informally, not only in Mexico but worldwide. Nevertheless, the WIEGO pyramid

model using data from Mexico also showed that in all categories of informal employment, women have lower earnings than men. Thus, the fact that men predominate informal employment should not detract from the importance of addressing other types of gender disparities that women working in informal labour markets are facing.

To recapitulate, this paper made several contributions to the literature about gender participation gaps in informal labour. It showed that men predominate in informal labour markets. It also challenged the prevailing belief that women have higher informality rates than men across countries. However, it confirmed that women are still facing gender disparities, as they predominate as unpaid family workers and have lower earnings in all types of informal employment. The paper also shows the problems of excluding agricultural activities from the estimations of informal labour. Hence, this paper also contributes to the agendas of Gender Equality and Decent Work of the Sustainable Development Goals by stressing the need for more accurate estimations of informal employment rates.

This research also has important implications from a policy perspective. It emphasised that the literature on this topic should not overlook that a substantial number of men are also affected by informal jobs. Ignoring this aspect leads to an incomplete understanding of labour informality and hinders the development of effective policies to address it. Therefore, this paper advocates for better estimations of informal employment rates, more accurate interpretation of labour statistics, and higher emphasis on how informal labour affects men and women differently.

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9 Appendix

Table 5 – ILO's definition of different concepts about labour informality

- *(a) Informal economy*:
  "All economic activities by workers or economic units that are – in law or practice – not covered or sufficiently covered by formal arrangements".

- *(b) Informal sector*:
  "A group of production units (unincorporated enterprises owned by households) including "informal own-account enterprises" and "enterprises of informal employers".

- *(c) Informal sector enterprise*:
  "Unregistered and/or small-scale private unincorporated enterprises engaged in non-agricultural activities with at least some of the goods or services produced for sale or barter".

- *(d) Employment in the informal sector*:
  "All jobs in informal sector enterprises (c), or all persons who were employed in at least one informal sector enterprise, irrespective of their status in employment and whether it was their main or a secondary job."

- *(e) Informal wage employment:*
  "All employee jobs characterized by an employment relationship that is not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits".

- *(f) Informal employment:*
  "Total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households; including employees holding informal jobs (e); employers and own-account workers employed in their own informal sector enterprises; members of informal producers' cooperatives; contributing family workers in formal or informal sector enterprises; and own-account workers engaged in the production of goods for own end use by their household".

- *(g) Employment in the informal economy*
  "Sum of employment in the informal sector (d) and informal employment (f) outside the informal sector; the term was not endorsed by the 17th ICLS".

Table 6 – World Bank Data to estimate the sex composition of the agricultural workforce (2022)

	Sub-Saharan Africa (SSF)	South Asia (SAS)	Europe & Central Asia (ECS)	East Asia & Pacific (EAS)	North America (NAC)	Middle East & North Africa (MEA)	Latin America & Caribbean (LCN)
Labor force, total (thousands) [SL.TLF.TOTL.IN.2022]	468,906,660	733,876,869	424,090,194	1,261,873,526	189,549,748	158,934,273	316,016,483
Labor force, female (% of total labor force) [SL.TLF.TOTL.FE.ZS.2022]	46.05	26.32	45.62	44.24	46.40	19.57	41.73
Labor force, male (% of total labor force) [Estimated by the author]	53.95	73.68	54.38	55.76	53.60	80.43	58.27
Female labor force, total (thousands) [Estimated by the author]	215,934,349	193,184,012	193,478,420	558,308,805	87,955,043	31,101,174	131,867,716
Male labor force, total (thousands) [Estimated by the author]	252,972,311	540,692,857	230,611,774	703,564,721	101,594,705	127,833,099	184,148,767
Employment in agriculture, female (% of female employment) [SL.AGR.EMPL.FE.ZS.2022]	51.56	59.18	6.59	19.49	0.98	12.83	7.62
Employment in agriculture, male (% of male employment) [SL.AGR.EMPL.MA.ZS.2022]	51.83	35.36	8.45	25.75	2.10	13.26	17.83
Female agricultural labor force, total (thousands) [Estimated by the author]	111,340,627	114,322,026	12,752,572	108,823,073	863,443	3,989,304	10,054,380
Male agricultural labor force, total (thousands) [Estimated by the author]	131,127,963	191,185,574	19,488,876	181,201,738	2,138,527	16,950,861	32,833,619
Agricultural labor force, total (thousands) [Estimated by the author]	242,468,590	305,507,600	32,241,448	290,024,811	3,001,969	20,940,165	42,887,999
Employment in agriculture, female (% of total agricultural labor force) [Estimated by the author]	45.92	37.42	39.55	37.52	28.76	19.05	23.44
Employment in agriculture, male (% of total agricultural labor force) [Estimated by the author]	54.08	62.58	60.45	62.48	71.24	80.95	76.56