ERF 31ST Annual Conference
YOUTH
DEMOGRAPHIC DIVIDEND & MIGRATION IN MENA:
CHALLENGES & OPPORTUNITIES IN UNCERTAIN TIMES
2025

reshaping the future

Harassment and Women's Employment:

Micro-Level Evidence in Egypt

Marina Hesham, Ariane Dupont-Kieffer, Racha Ramadan and Hanan Nazier

ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية

Harassment and women's employment: Micro-level evidence in Egypt

Marina Hesham[1] Ariane Dupont-Kieffer[2] Racha Ramadan[3] Hanan Nazier[4]

Abstract

Sexual harassment is a pervasive form of Violence Against Women (VAW) globally. Egyptian women face harassment in public spaces, such as streets and transportation. Despite its widespread nature, harassment has not been thoroughly examined as a barrier to women's access to economic opportunities. This study investigates the impact of harassment on female labor force participation (FLFP) in Egypt, using data from the Egypt Economic Cost of Gender-Based Violence Survey (ECGBVS) and a Two-Stage Least Squares (2SLS) methodology. The findings reveal that harassment in public spaces significantly limits women's mobility, reducing their labor force participation due to safety concerns. The analysis further identifies key mediating factors: older women, married women, and urban residents are particularly affected, as they are more likely to withdraw from the labor market following harassment. Additionally, the study highlights that harassment influences women's employment sector choices, pushing them toward sectors perceived as safer and more secure.

Keywords: violence against women, harassment, transportation, female labor force participation, Egypt.

JEL Codes: J16, J22, R41

[1] Assistant lecturer of economics at the faculty of Economics and Political Science, Cairo University and PhD Candidate, Cairo University and University of Paris 1 Panthéon Sorbonne
Email: marina.hesham@feps.edu.eg
[2] Professor of economics, PHARE - University of Paris 1 Panthéon Sorbonne, Paris, France. Email: Ariane.Dupont-Kieffer@univ-paris1.fr
[3] Professor of economics, Faculty of Economics and Political Sciences, Cairo University, Cairo, Egypt. Email: racha.ramadan@feps.edu.eg
[4] Professor of economics, Faculty of Economics and Political Sciences, Cairo University, Cairo, Egypt. Email: Hanan.nazier@feps.edu.eg

1. Introduction

Sexual harassment is among the most pervasive forms of Violence Against Women (VAW) worldwide. Similar to other forms of VAW, it represents a violation of women's rights and poses a significant barrier to their full participation in economic and social life. It also has far-reaching adverse effects on women's mental and physical health, incurring substantial costs that include healthcare expenses, legal fees, and productivity losses, as highlighted by UN Women. Compared to other manifestations of VAW, sexual harassment may result in particularly severe consequences. For instance, the fear of harassment in public spaces can discourage women from engaging in societal activities, thereby restricting their access to economic opportunities (UN Women, 2018).

Despite its profound impact, empirical research on the economic costs of sexual harassment remains limited. This research gap is largely attributable to insufficient data on the prevalence of sexual harassment in public spaces, including streets, public transportation, workplaces, and educational institutions. While there have been efforts to enhance data collection on VAW, many forms, including sexual harassment, remain underreported. For example, the World Bank's Gender Data Portal reveals that indicators of sexual violence are often incomplete. Data on the proportion of women who have experienced sexual violence is typically reported only at five- or ten-year intervals, and even then, only by a small number of countries. Over the past two decades, no more than 33 of 184 countries have consistently reported on this indicator.

Similar to many other countries, the Middle East and North African (MENA) region suffers from a lack of reliable data on sexual harassment. In Egypt, several studies have sought to estimate its prevalence. For example, Roushdy and Sieverding (2015) and Hassan (2020) reported rates of approximately 40%, although these figures are likely underestimated due to underreporting. Data collection on sexual harassment in Egypt is particularly difficult, as the topic has traditionally been regarded as taboo (AbdelFattah et al., 2022; Hassan et al., 2023).

Recognizing the potential economic consequences of sexual harassment, the Central Agency for Public Mobilization and Statistics (CAPMAS), in collaboration with the National Council for Women (NCW) and the United Nations Population Fund (UNFPA), undertook efforts in 2015 to collect micro-level data on the issue. This initiative aimed to assess the incidence of various forms of Violence Against Women (VAW), their impact on women's well-being, and their associated economic costs. The resulting report revealed that 7.8 million Egyptian women experience violence annually, whether perpetrated by intimate partners, family members, or strangers. The economic costs of such violence were estimated at 6 million EGP[5] (UNFPA, NCW, and CAPMAS,

[5] These costs are calculated based on health expenditures, legal fees, lost wages, and other associated expenses incurred by victims of violence.

2015). Hinging on this dataset, this paper focuses specifically on one critical outcome of violence against women: its potential impact on women's participation in the labor market.

Female labor force participation (FLFP) rates in Egypt have remained strikingly low over the past decades. According to World Development Indicators, FLFP in Egypt was approximately 17% in 2022, significantly below the global average of 53%, the middle-income country average of 50%, and even the MENA regional average of 20%. These persistently low rates, especially compared to similar groups of countries, have consistently raised questions about the underlying determinants of FLFP in Egypt. Historical data from the World Bank indicates that since 1991, FLFP in Egypt has never surpassed 25%, highlighting a structural barrier to women's participation in the labor market over the years.

The literature on female labor market outcomes is extensive, with numerous studies seeking to explain the disproportionately low employment rates of women compared to men. Economic research has traditionally focused on demographic variables as the primary determinants of FLFP, such as age, education, marital status, and area of residence. Among these factors, education has been identified as a key driver of increased FLFP in Egypt, consistent with findings in other countries. However, despite notable improvements in women's educational attainment in recent years, female labor force participation has not risen proportionately. This disconnect is a widely observed phenomenon across Arab states, including Egypt, and is referred to in the literature as the "MENA Paradox" (Assaad et al., 2020). These observations underscore the need to explore additional factors that may constrain women's active engagement in the labor market.

A critical factor influencing women's labor force participation (LFP) is the impact of gender norms on societal roles. Gender norms encompass beliefs about gender roles, power dynamics between men and women, and the expected behavior of each gender (UNICEF & UNFPA, 2022). In Egyptian society, deeply ingrained cultural norms often discourage women from engaging in the labor market (Nazier and Ramadan, 2016). When societal expectations confine women's roles to marriage and caregiving, many women opt to withdraw from the workforce (Hendy, 2015; UN Women, and ERF, 2020; Atallah and Hesham, 2024).

The influence of gender norms extends beyond time-use disparities and traditional gender roles; it is also closely linked to the prevalence of violence, particularly in public spaces. These norms often make reporting incidents of harassment more difficult, thereby exacerbating the issue (Bergenfeld et al., 2021). In societies like Egypt, where such norms are deeply entrenched, the intersection of sexual harassment and female labor force participation (FLFP) demands greater attention. Despite its importance and increasing recognition on the national agenda, economic research on the impacts of harassment on women's labor market outcomes remains sparse. This gap highlights the necessity of further exploring how harassment, as a form of violence in public spaces, restricts women's economic participation.

The objective of this study is to empirically investigate how harassment in public spaces serves as a barrier to women's participation in the labor market. The remainder of this paper is structured as follows: Section 2 reviews the existing literature on the relationship between harassment and women's labor market outcomes, Section 3 outlines the data and methodology used in the analysis, Section 4 presents and discusses the empirical findings, Section 5 presents the potential mediating channels, and Section 6 concludes with policy recommendations.

2. Literature review:

It has become increasingly clear that gender gaps in labor force participation are more complex than the simple explanations provided in traditional literature. While much of the existing research has focused on supply-side barriers for women and demand-side discrimination, it has often overlooked the importance of contextual factors. Halim et al. (2023) emphasize that contextual factors such as violence against women and harassment impose a significant toll on women's participation in economic life. However, they argue that the body of literature examining this issue is still in its early stages and requires further exploration. In line with their observations, this section demonstrates that research on the link between violence and women's employment outcomes remains limited across various economies, highlighting a gap in the current understanding of how such factors influence women's economic opportunities and participation.

2.1. Conceptual framework:

Security concerns play a significant role in shaping women's economic decisions and behaviors. It has been suggested that women's fear of potential victimization in public spaces can lead them to forgo opportunities to avoid interactions with harassers. Siddique (2018), drawing on Becker and Rubenstein's (2011) work, demonstrated that women living in unsafe neighborhoods are more likely to fear becoming victims of violence. In such cases, even a small possibility of harm can have large impacts on their behavior. Rational agents, according to Becker and Rubenstein, may forgo consuming potentially hazardous goods if the expected cost outweighs the utility. Applied to women's decisions, the potential risk of violence or harassment may overshadow the benefits of entering the labor market, leading women to avoid paid employment, which they perceive as a "hazardous good." Thus, the fear of victimization can act as a barrier to women's participation in the labor force.

Additionally, it's important to note that women's fear of victimization may not always correlate with actual rates of harassment. Rather, media portrayals of violence against women often amplify the perceived risk of victimization, even in areas where actual harassment rates are low (Siddique, 2022). This effect is especially pronounced in communities with traditional gender norms, where women's purity is highly valued, and incidents of harassment are often blamed on the victim. In such communities, women are more likely to avoid situations where they might face harassment, reflecting a heightened sense of insecurity compared to women living in more gender-equal societies (Graglia, 2016; Pimkina and De la Flor, 2020; Field and Vyborny, 2022).

Exploring the relationship between violence outside the household and women's employment opens the door to a deeper investigation of the transportation literature, particularly the gendered perspectives on transportation. Transportation infrastructure impacts daily life decisions in ways that differ for men and women. Bellmann et al. (2020) discuss how women's transportation needs often diverge from mens'. For example, transportation systems should be designed to meet the needs of all individuals in terms of safety, accessibility, and convenience.

The literature on gender and transportation often emphasizes women's issues with time poverty. As primary caregivers, women need transportation systems that reduce commuting time to balance work and family responsibilities (Madden, 1980; Ehab, 2018; Jacob et al., 2019). Yet, the security aspect of transportation is often overlooked. According to Becker and Rubenstein's (2011) analytical framework, women who encounter violence in public transportation are more likely to be deterred from joining the labor force. Therefore, incorporating transportation security into the analysis of female labor force participation is crucial. Secure transportation infrastructure plays a pivotal role in enabling women to access economic opportunities. Without it, women may be deterred from participating in the labor market, limiting their economic mobility (Lei et al., 2019; Nahar and Cronley, 2021; Tiznado-Aitken et al., 2024).

2.2. Empirical framework:

Empirical research on the relationship between street-based harassment and women's labor force participation remains limited. Yet, existing studies suggest that women's behavior is shaped not only by the risk of victimization but also by societal norms and perceptions regarding these incidents. For instance, Chakraborty et al. (2018), using data from the Indian Human Development Survey (2004/2005), found that women are more likely to work closer to home when the risk of sexual harassment is high. The effect is particularly pronounced in communities where women face greater stigma if they are victims of harassment. Similarly, Siddique (2018) examines the impact of media-reported sexual and physical harassment on women's labor supply, using data from the National Sample Survey. The study reports a significant negative effect on women's participation in the labor market, even after controlling for variables such as age, education, marital status, and household characteristics.

Regarding transportation, several experimental studies highlight the challenges women face in using public transportation. They address the factors contributing to harassment, policy recommendations to reduce its prevalence, and its impact on women's labor force participation. In Mexico City, Graglia (2016) notes that men often do not view violence against women in public spaces as a societal issue, with some even accepting it due to traditional gender roles that restrict women to domestic spheres. As a result, women develop coping mechanisms to avoid becoming victims. In Ethiopia, Kacharo et al. (2022) identify factors influencing harassment in public transportation, finding that younger, single women are more likely to experience harassment,

particularly when commuting at night. The study suggests policies such as surveillance, women-only vehicles, and improved lighting in public spaces to increase women's use of public transportation and, consequently, their participation in the labor force.

Supporting these findings, other studies show that improvements in transportation infrastructure can boost women's mobility and employment. In Peru, a metro infrastructure project launched in 2010 was evaluated by Martinez et al. (2019), who used a difference-in-difference method to analyze data from the Peruvian National Household Survey before and after the project. Their results revealed that better transportation access led to an increase in female labor force participation, particularly among women who were previously unemployed. However, the effect was not significant for men. In India, Lei et al. (2019) used a fixed-effects analysis based on two waves of the Indian Human Development Surveys and found that public transportation improvements significantly increased labor force participation, with women benefitting more than men. In Pakistan, Field and Vyborny (2022) conducted a Randomized Control Trial (RCT) to examine how transportation availability affects labor market choices for both women and men. Their findings showed that secure transportation options made women more likely to accept jobs, even if it involved a wage deduction for transportation. Men, however, were less inclined to use public transportation, preferring private transport even at the cost of salary deductions. This suggests that men are less reliant on public transportation, while transportation security is a more significant factor for women's labor market decisions.

2.3. Literature in Egypt:

In Egypt, harassment incidents are often attributed to traditional gender norms that reinforce male dominance over women. Since harassment stems from imbalanced power dynamics, the societal privileges afforded to men often embolden them to perpetrate such acts. However, the concept of "harassment" remains contested in Egyptian literature. While women may share informal conversations about their experiences, systematic data collection on harassment incidents remains challenging (Abul Komsan, 2009).

The absence of reliable data on harassment complicates efforts to assess the socio-economic impacts of violence against women. As Abul Komsan (2009) notes, several factors hinder the collection of such data. First, achieving consensus on a definition of harassment is challenging, as it encompasses various forms, including verbal and physical abuse. Second, societal norms often place the blame for harassment on women rather than on the perpetrators, discouraging victims from reporting incidents due to a lack of trust in receiving adequate support. This phenomenon, known as "under-reporting," is widely recognized in the literature on violence.

Stewart et al. (2024) identify key reasons for the under-reporting of sexual violence by women. They highlight three primary factors: self-blame, the traumatizing nature of reporting, and the absence of evidence. Many women struggle to report harassment or assault due to feelings of self-

blame, often exacerbated by societal attitudes that defend perpetrators while blaming victims as mentioned. Reporting incidents is also a highly traumatizing experience, as it requires women to relive the details of the event. Furthermore, many women face challenges in providing concrete evidence to substantiate their claims, further deterring them from seeking justice. However, in recent years, women have increasingly used social media platforms to advocate for themselves and seek protection from harassment. Various social media campaigns have been launched to encourage women to report incidents of harassment and cooperate with law enforcement authorities to ensure justice (Marzouk and Vanderveen, 2021).

Building on the points discussed earlier and, in the introduction, it is clear that studies addressing the impacts of violence, particularly violence in public spaces, are scarce. However, this does not imply that such incidents lack significant negative effects on women. For example, Arafa et al. (2020), in their study on a sample of women residing in two Egyptian governorates, found that sexual harassment adversely impacts women's mental health, causing distress and anxiety. Additionally, they noted that women who report these incidents often face a lack of support from their families. When examining the economic effects on women's employment, Constant et al. (2020) emphasized that mobility is a critical constraint on women's economic decisions in Egypt. They further highlighted that harassment in public spaces disproportionately affects women compared to men, further limiting their mobility.

In summary, the literature suggests that harassment in public spaces poses a significant barrier to women's labor market outcomes. However, studies on female labor force participation in Egypt have largely neglected the dimension of violence. Even when the issue of violence has been addressed, the focus has primarily been on intimate partner violence, as noted in the work of Giovanis and Ozdamar (2022). This underscores the need to incorporate another critical aspect of women's security into the literature. This paper, therefore, makes three key contributions. First, it is among the first studies to empirically assess the effects of harassment on FLFP using a nationally representative dataset, as detailed in the next section. Second, it extends the FLFP literature in Egypt by offering a new perspective that may help explain the persistently low participation rates. Third, it connects the research question to the transportation literature, shedding light on how mobility and security concerns intersect with women's economic participation.

3. Data and methodology:

The analysis utilizes data from the *Egypt Economic Cost of Gender-Based Violence Survey (ECGBVS)*. This survey, conducted in 2015, was a collaborative effort by the Central Agency for Public Mobilization and Statistics (CAPMAS), the National Council for Women (NCW), and the United Nations Population Fund (UNFPA). The project aimed to estimate the economic costs associated with violence against women (VAW) in Egypt. To achieve this, micro-level data was collected to measure the incidence rates of various forms of VAW, their effects on women's well-being, and their associated economic consequences. Fieldwork was conducted between April and

June 2015, but the complete dataset was only made publicly available by the Economic Research Forum (ERF) in 2022.

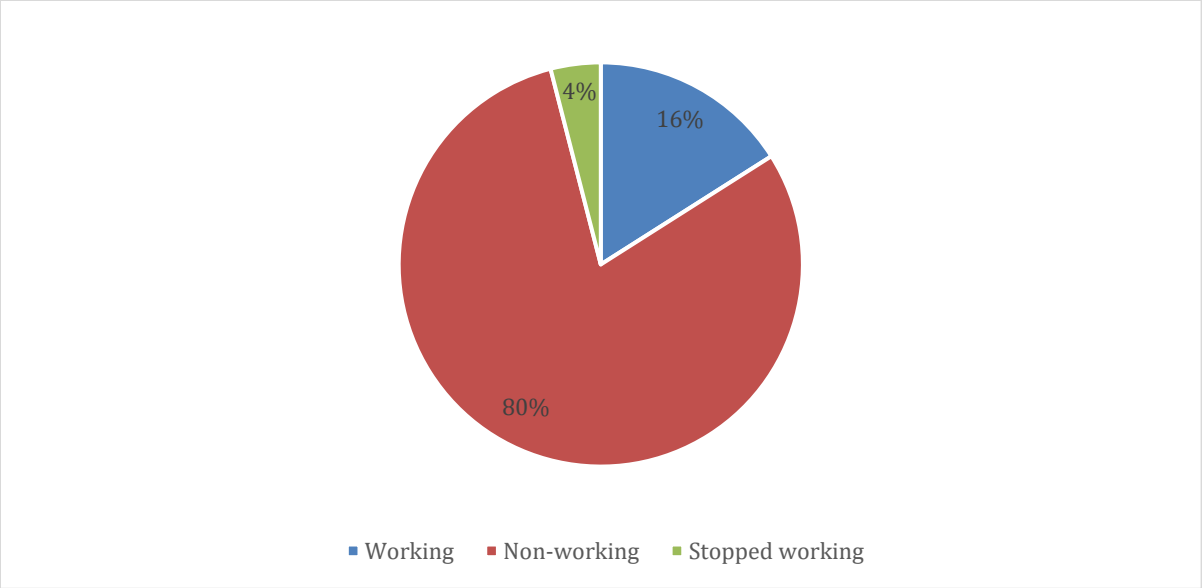
The dataset includes responses from 21,448 households and 20,157 eligible women aged 18 to 64 years. Data collection followed a two-stage sampling method. In the first stage, 1,000 enumeration areas were randomly selected across Egyptian governorates. In the second stage, 22 households were selected per enumeration area in urban regions and 21 in rural areas. The dataset is nationally representative of the Egyptian population, employing appropriate individual weights to ensure accuracy. Using this dataset, the study investigates the impact of two forms of VAW in public spaces on women's labor force participation. In addition, consistent with the broader literature on FLFP, the analysis incorporates control variables such as women's individual characteristics, household dynamics, and community factors, which are detailed in Section 3.3.

3.1. Female labor force participation and employment patterns:

The analysis focuses on women aged 18 to 60, aligning with Egypt's official retirement age of 60. Restricting the data to this age range allows for more accurate insights into labor force participation. In the survey, women were asked whether they had worked in the past 12 months as an indicator of their labor force participation.

As illustrated in **Figure 1**, 16% of respondents reported that they are currently employed, 80% indicated they are not working, and 4% stated they had stopped working due to retirement or temporary leave.

Figure 1: women's working status in Egypt



Source: author's calculations using ECGBVS data, 2015

Among women active in the labor market, a significant proportion are employed in the public sector, consistent with prior studies highlighting its role in promoting female employment in Egypt (Barsoum, 2021). As shown in **Figure 2**, 55% of working women are employed in the public sector, 37% in the private sector, and 8% in the informal sector. Regarding employment type, the majority of working women (80%) are paid employees. The remaining 20% are evenly distributed between self-employment/employer roles and unpaid family work, as depicted in **Figure 3**.

Figure 2: Women's employment by sector

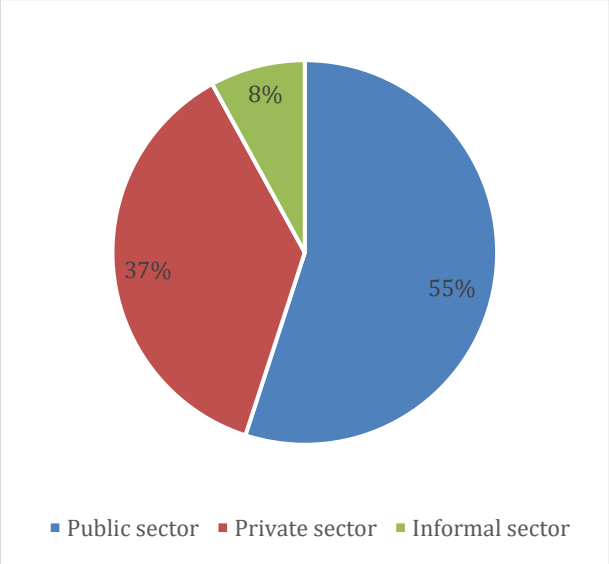
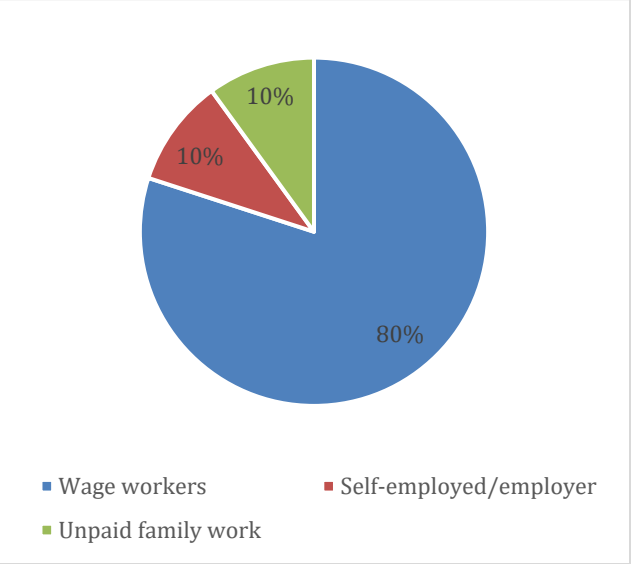


Figure 3: Women's employment by type



Source: author's calculations using ECGBVS data, 2015

3.2. VAW in public spaces:

The analysis focuses on incidents of harassment occurring in public spaces mainly the streets and public transportation. Women were asked if they had experienced any form of violence against women (VAW) within the past 12 months. According to **Figure 4**, 12% of respondents reported being victims of sexual harassment in public spaces during the past year. Specifically, 6% reported harassment in public transportation, while 9% experienced it on the streets.

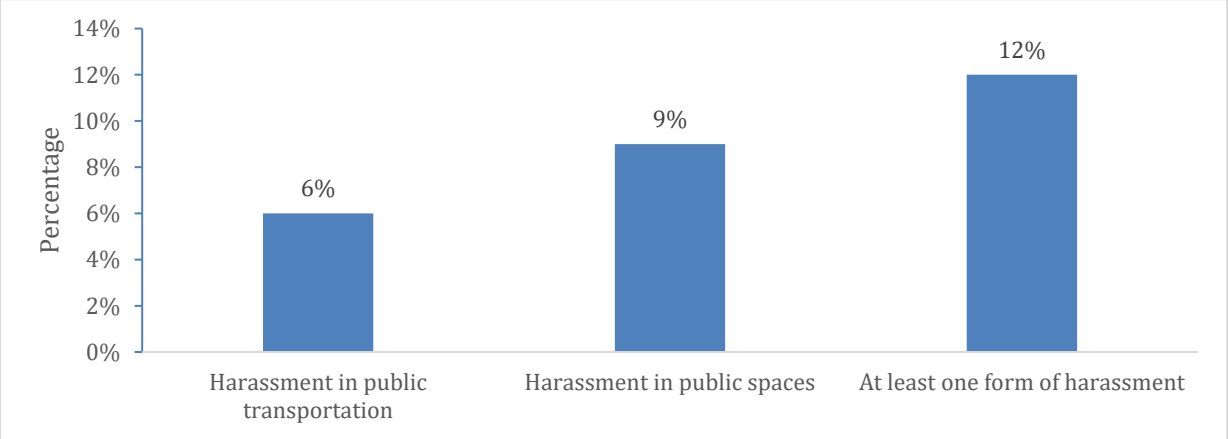
For those who reported harassment, 30% of incidents in transportation occurred very frequently, ranging from at least once a week to daily. Most cases occurred in the most commonly used modes of transport, with 90% of incidents reported on buses and metros. Harassment in the streets, however, was even more frequent, with 75% of victims encountering incidents at least once a week. In terms of timing, 60% of reported harassment cases, both in transportation and on the streets, occurred during the afternoons and evenings.

To empirically measure VAW in public spaces, three dummy variables are employed. The first dummy variable equals 1 if a woman experienced harassment in streets or transportation in the past 12 months. The second dummy captures harassment specifically in streets, while the third

focuses on harassment incidents in transportation. Three models are estimated, each using one of these dummies as the primary variable of interest.

The model with the first dummy provides an overarching view of the impact of sexual harassment on female labor force participation (FLFP). The models with the second and third dummies allow for a more nuanced analysis, disentangling the distinct effects of harassment in public spaces and in transportation on FLFP.

Figure 4: Sexual harassment incidence rates in public spaces and transportation



Source: author's calculations using ECGBVS data, 2015

3.3. Covariates:

To obtain unbiased estimates, the model includes a range of control variables: the woman's characteristics (age, education level, marital status, and whether she has a source of income other than labor income), household characteristics (area of residence, household size, and number of hours spent on unpaid care work), and the woman's attitude toward gender equality. These demographic and community factors are crucial in determining a woman's decision to join the labor force (Hendy, 2015; Hosney, 2016; Lassassi and Tansel, 2020). Additionally, a woman's perception of her role in society, as measured by her attitude toward gender equality, likely influences her view on labor force participation. This link was discussed by Nazier and Ramadan (2016) in their work on the relationship between social norms and women's employment.

To quantify attitudes toward gender equality, the analysis combines responses to two questions into a dummy variable. The first question asks if a woman believes she must obey her current or future husband, even if she disagrees with his opinion. The second question inquires if the man should have control over the household. The dummy variable is coded as 1 if a woman answers "yes" to at least one of these questions.

Table 1 reveals that working women tend to be older and more educated than their non-working counterparts. Furthermore, among employed women, a smaller percentage are married (75.8%)

compared to non-employed women (84.2%). In terms of residential location, women living in urban areas are more likely to be employed than those in rural areas. Additionally, working women tend to live in larger households but spend fewer hours on unpaid care work. Notably, there is a stronger consensus on gender equality among employed women compared to those not working.

Table 1: Covariates by women's employment status

	(1) **Not working**	**(2)** **Working**	**(1-2)** **Diff**
Age	38.3	40.1	-1.87*** (0.22)
Education level			
Primary	0.22	0.09	0.13*** (0.007)
Preparatory	0.2	0.11	0.09*** (0.007)
Secondary	0.46	0.34	0.11*** (0.01)
University and above	0.13	0.46	-0.33*** (0.01)
Married	0.85	0.77	0.08*** (0.008)
Household size	4.6	4.4	0.24*** (0.035)
Hours of unpaid care work	4.2	3.9	0.27 (0.153)
Having other source of income	0.09	0.09	0.001 (0.005)
Region			
Urban	0.41	0.56	-0.14*** (0.01)
Rural	0.59	0.44	0.14*** (0.01)
Attitudes towards gender equality	0.53	0.37	0.16*** (0.009)

Source: author's calculations using ECGBVS data, 2015

3.4. Empirical specification:

To consider the relationship between harassment and female labor force participation, we estimate the following model:

$$y_i = \alpha_0 + \beta\ harassment_i + \delta_0 X_i + \varepsilon_{0i} \qquad (1)$$

In the econometric specification, $\boldsymbol{y_i}$ represents a binary variable indicating labor force participation for woman $\boldsymbol{i}$. The variable $\boldsymbol{harassment_i}$ is a dummy variable capturing whether woman $\boldsymbol{i}$ has experienced harassment, measured by three different dummies, each corresponding to a specific model. $\boldsymbol{X_i}$ denotes the set of control variables included in the model, which were detailed in the covariates section. These control variables account for factors such as the woman's demographic characteristics, household attributes, and attitude toward gender equality.

Given the binary nature of the dependent variable, a discrete choice model is appropriate for estimation. Many studies examining violence against women (VAW) typically use logistic or Probit regressions. However, Angrist and Pischke (2008) recommend the use of Linear Probability Models (LPM), as they do not rely on a specific distribution and generally perform better when including multiple fixed effects in the model. Despite this, LPMs have a significant drawback: they produce heteroskedastic standard errors (Fajardo-Gonzalez, 2021). To address this, both LPM and Probit models will be employed in this study to ensure more accurate results.

In addition to the issue of heteroskedasticity and the tradeoff between LPM and Probit, the literature on VAW suggests that endogeneity could bias the estimates. While most studies highlighting endogeneity focus on the relationship between employment and intimate partner violence, similar concerns apply to violence in public spaces. Endogeneity in this context may arise from several sources. First, reverse causality could be at play: violence against women can impact their labor market outcomes, but, participating in the labor market might also increase exposure to violence. Exposure theories suggest that working women may be more vulnerable to sexual harassment in public spaces due to the increased frequency with which they need to leave their homes compared to non-working women (Rios-Avila and Canavire-Bacarreza, 2015).

Another factor contributing to endogeneity is unobserved heterogeneity, as women who are more vulnerable to violence are not randomly selected. This suggests that unobservable characteristics influencing both labor force participation and the likelihood of experiencing harassment could introduce bias in the results. Furthermore, measurement error due to under-reporting of violence incidents is a significant issue. In traditional communities, women may avoid reporting harassment due to fear of social stigma or a lack of confidence that they will receive support. This under-reporting is expected to lead to an underestimation of harassment rates. Previous studies on harassment in Egypt have reported occurrence rates around 40% (Roushdy and Sieverding, 2015; Hassan, 2020; Hassan et al., 2023), highlighting the potential for substantial under-reporting in the data used for this study.

Given these potential sources of endogeneity, it is crucial to consider and account for them in the analysis to ensure that the estimates reflect the true relationship between harassment and women's labor market outcomes. In consequence, our estimate of interest is more likely to be downward-biased under such a setting. As a solution to that matter, it’s more convenient to use the 2SLS methodology as follows:

$$harassment_i = \alpha_1 + \theta\, Z_i + \delta_1 X_i + \varepsilon_{1i} \qquad (2)$$

$$y_i = \alpha_2 + B_{2SLS}\widehat{harassment}_\iota + \delta_2 X_i + \varepsilon_{2i} \quad (3)$$

In the first stage, variables measuring different forms of violence against women are predicted using the same set of control variables (X) that were included in the initial model specification, along with an instrument (z). Following the approach suggested by Rios-Avila and Canavire-Bacarreza (2015), the harassment occurrence rate at the governorate level is used as the instrument. The rationale behind this choice is that women living in governorates with higher rates of harassment are more likely to experience it themselves, and their perceptions of harassment risk are also expected to be higher compared to women in areas with lower harassment incidence. This instrument allows for the identification of harassment's impact on labor force participation by isolating it from other factors, ensuring that the influence on labor force participation is only through the woman's personal experience with harassment. To maintain the integrity of the instrument, the woman's own experience of harassment is excluded when calculating the average harassment rate at the governorate level, preventing any reverse causality between labor force participation and harassment rates.

In the second stage, the predictions of harassment incidence derived from the first stage are used in the model to estimate the impact of harassment on women's labor force participation. This two-stage approach helps address potential endogeneity issues, allowing for a more accurate estimation of the relationship between harassment and labor force participation. If our instruments are valid, they should fulfill two conditions: $\theta \neq 0$ and $E(Z_i \varepsilon_{2i})=0$. In a nutshell, the selected methodology attempts at mitigating the problems of selection bias and endogeneity that may intervene with our results.

4. Empirical findings: does sexual harassment represent an impediment to women's employment in Egypt?

4.1. Harassment and female labor force participation (FLFP)

Table 2 presents the results of baseline regressions using both the Linear Probability Model (LPM) and Probit models. These models examine the impact of harassment on women's labor force participation (FLFP) using three harassment variables: one for any form of harassment in public spaces (street or transportation), one for street harassment, and one for transportation harassment. The findings from both models indicate that, while the coefficients for all three harassment variables carry the expected negative sign, none of these variables are statistically significant in influencing women's decision to participate in the labor force. Conversely, the covariates included in the models align with existing literature. Specifically, older and more educated women are more likely to participate in the labor market, while married women, women with additional sources of income, and women with attitudes against gender equality are less likely to engage in the labor market.

Given the potential endogeneity between FLFP and harassment, an insignificant coefficient does not rule out the possibility of an underlying relationship. The coefficients may suffer from bias, which could affect their statistical significance. To address this concern, we use the Two-Stage Least Squares (2SLS) method, incorporating an instrumental variable to correct for endogeneity. The instrument used is the average rate of harassment in the governorate where each woman resides. For instance, transportation harassment is measured using the average number of harassment incidents on public transportation within the woman's governorate.

Table 3 reports the results from the IV regressions. The effects of the covariates remain consistent, but the harassment variables now show a significant negative impact on FLFP. Notably, the magnitude of the effect is largest for transportation harassment, suggesting that concerns about transportation security play a critical role in limiting women's labor market participation. This finding underscores the need for discussions on improving women's access to secure mobility, highlighting its connection to economic well-being.

From a methodological perspective, when comparing the results in Tables 2 and 3, the IV estimates show an inflated coefficient relative to the LPM estimates. As Gedikli et al. (2023) explain, the LPM calculates the effect for the entire population, whereas the IV method focuses on the subpopulation of "compliers"—those for whom a change in the instrument leads to a change in the dependent variable. This does not indicate poor estimation quality. Table 1 in the appendix presents the first-stage results and the necessary tests, confirming that the chosen instruments have a significant relationship with the endogenous variables and are valid and reliable, as demonstrated by the endogeneity test and the Kleibergen-Paap F-statistic.

Table 2: LPM and Probit models results, dependent variable (LFP)

	(1) LPM	(2) LPM	(3) LPM	(4) Probit	(5) Probit	(6) Probit
Harassment	-0.0254			-0.102		
	(0.0191)			(0.0835)		
Street harassment		-0.00790			-0.0260	
		(0.0218)			(0.0916)	
Transportation harassment			-0.0339			-0.133
			(0.0242)			(0.106)
age	0.0257***	0.0256***	0.0255***	0.123***	0.123***	0.122***
	(0.00525)	(0.00525)	(0.00523)	(0.0253)	(0.0253)	(0.0252)
age^2	-0.000260***	-0.000257***	-0.000258***	-0.00127***	-0.00126***	-0.00126***
	(6.96e-05)	(6.95e-05)	(6.93e-05)	(0.000319)	(0.000319)	(0.000318)
Education: reference group primary education						
Preparatory	0.0645***	0.0633***	0.0646***	0.289**	0.283**	0.287**
	(0.0216)	(0.0216)	(0.0217)	(0.113)	(0.113)	(0.113)
Secondary	0.0773***	0.0771***	0.0781***	0.362***	0.361***	0.364***
	(0.0189)	(0.0189)	(0.0189)	(0.1000)	(0.0999)	(0.100)
University or above	0.355***	0.354***	0.355***	1.236***	1.233***	1.238***
	(0.0270)	(0.0270)	(0.0271)	(0.108)	(0.108)	(0.108)
Household size	-0.00591	-0.00587	-0.00574	-0.0242	-0.0240	-0.0236
	(0.00469)	(0.00469)	(0.00470)	(0.0211)	(0.0211)	(0.0211)
Hours of unpaid carework	0.000724	0.000426	0.000603	0.00216	0.000930	0.00164
	(0.00194)	(0.00194)	(0.00194)	(0.00811)	(0.00816)	(0.00809)
Other income	-0.119***	-0.118***	-0.118***	-0.502***	-0.498***	-0.501***
	(0.0243)	(0.0243)	(0.0242)	(0.118)	(0.118)	(0.118)
Rural region	0.0334**	0.0349**	0.0344**	0.164**	0.171***	0.169***
	(0.0156)	(0.0157)	(0.0156)	(0.0654)	(0.0658)	(0.0654)
married	-0.180***	-0.179***	-0.180***	-0.685***	-0.681***	-0.688***
	(0.0279)	(0.0279)	(0.0278)	(0.0994)	(0.0993)	(0.0993)
Perceptions against gender equality	-0.0400***	-0.0396***	-0.0402***	-0.187***	-0.185***	-0.188***
	(0.0149)	(0.0149)	(0.0149)	(0.0662)	(0.0662)	(0.0661)
Constant	-0.319***	-0.325***	-0.321***	-3.495***	-3.523***	-3.495***
	(0.0951)	(0.0951)	(0.0950)	(0.495)	(0.495)	(0.494)
Observations	2,845	2,845	2,845	2,845	2,845	2,845
R-squared	0.141	0.141	0.141			

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

Table 3: Harassment and FLFP, 2SLS model results, dependent variable (FLFP) [6]

	(1) IV	(2) IV	(3) IV
Harassment	-0.276***		
	(0.0785)		
Street harassment		-0.325***	
		(0.0951)	
Transportation harassment			-0.431***
			(0.134)
Age	0.0272***	0.0273***	0.0257***
	(0.00550)	(0.00557)	(0.00557)
Age_squared	-0.000297***	-0.000297***	-0.000274***
	(7.31e-05)	(7.40e-05)	(7.34e-05)
Education: reference group primary education			
Preparatory	0.0793***	0.0743***	0.0829***
	(0.0228)	(0.0226)	(0.0237)
Secondary	0.0773***	0.0731***	0.0883***
	(0.0196)	(0.0197)	(0.0202)
University or above	0.361***	0.359***	0.372***
	(0.0277)	(0.0279)	(0.0287)
Household size	-0.00652	-0.00692	-0.00457
	(0.00490)	(0.00494)	(0.00507)
Hours of unpaid care work	0.00474**	0.00479**	0.00396*
	(0.00238)	(0.00242)	(0.00236)
Other income	-0.131***	-0.138***	-0.126***
	(0.0253)	(0.0256)	(0.0253)
Rural region	0.00999	-0.000963	0.0188
	(0.0174)	(0.0189)	(0.0173)
married	-0.194***	-0.196***	-0.204***
	(0.0285)	(0.0285)	(0.0296)
Perceptions against gender equality	-0.0467***	-0.0491***	-0.0498***
	(0.0158)	(0.0162)	(0.0161)
Constant	-0.241**	-0.224**	-0.241**
	(0.102)	(0.105)	(0.105)
Observations	2,845	2,845	2,845
R-squared	0.082	0.066	0.046

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

[6] Results of the 1st stage and the endogeneity tests can be consulted at Table-A1 in the appendix

4.2. Robustness check

Addressing the econometric challenge posed by an endogenous dummy variable raises the issue of forbidden regression in the literature. Forbidden regression generally refers to instances where the two-stage least squares (2SLS) methodology is misapplied, typically by omitting or improperly executing critical steps. This issue has been thoroughly discussed by Cameron and Trivedi (2005), Angrist and Pischke (2009), and Wooldridge (2010). These scholars identify two primary forms of forbidden regression.

The first occurs when the dependent variable (y) is directly regressed on the instrument (z) without recognizing that (z) influences (y) only through its correlation with the endogenous variable (x). The second example involves applying linear 2SLS when (x) is a binary endogenous variable. In this case, the method is misapplied because linear models are used inappropriately. Specifically, in the first stage of 2SLS, the binary endogenous variable (x) is regressed on the instrument (z) using ordinary least squares (OLS), without acknowledging (x)'s binary nature. Consequently, the predicted values from the first stage often fall outside the [0,1] range, leading to biased second-stage estimates. This misapplication results in two key problems: biased estimates and model misspecification, where the non-linear nature of the binary variable is neglected.

To avoid forbidden regression in our analysis, we adopt the approach proposed by Adams et al. (2009). Their solution involves a three-stage IV method. First, a Probit model is employed to regress the endogenous dummy variable (x) on the instrument (z) and control variables. In the second stage, the endogenous dummy (x) is regressed on the predicted values from the first stage using linear regression, generating new predictions. Finally, the outcome variable (y) is regressed on the second-stage predictions and control variables. Given that (y) is also binary in our analysis, the third stage is estimated using a Probit model as well. This process ensures that the binary nature of both the endogenous variable and the outcome is properly accounted for and it can be presented as follows:

$$\Pr\left(harassment_i\right) = \alpha_1 + \theta\, Z_i + \delta_1 X_i + \varepsilon_{1i} \quad (4)$$

$$harassment_i = \alpha_2 + \gamma \widehat{harassment}_{1\iota}\, \theta\, Z_i + \delta_2 X_i + \varepsilon_{2i} \quad (5)$$

$$\Pr\left(y_i\right) = \alpha_3 + B_{2SLS} \widehat{harassment}_{2\iota} + \delta_3 X_i + \varepsilon_{3i} \quad (6)$$

The results in **Table 4** confirm the robustness of the previous findings, showing that harassment in public spaces significantly reduces the probability of women joining the labor force. The results are consistent as well with the existing literature on the determinants of female labor force participation in Egypt. Specifically, age has a non-linear effect on FLFP, while education has a strong positive influence, with the highest impact observed at the highest levels of education. In contrast, married women and those with alternative sources of income are less likely to participate

in the labor force. Additionally, women who hold negative perceptions regarding gender equality, reflecting societal norms, are less likely to engage in the labor market.

Table 4: Harassment and FLFP, 3 stages IV approach results, dependent variable (FLFP)

	(1) 3 stages IV	(2) 3 stages IV	(3) 3 stages IV
Harassment	-0.756**		
	(0.319)		
Street harassment		-1.076**	
		(0.523)	
Transportation harassment			-1.076**
			(0.523)
Age	0.128***	0.123***	0.123***
	(0.0256)	(0.0253)	(0.0253)
Age_squared	-0.00137***	-0.00130***	-0.00130***
	(0.000324)	(0.000320)	(0.000320)
Education: reference group primary education			
Preparatory	0.327***	0.332***	0.332***
	(0.115)	(0.115)	(0.115)
Secondary	0.365***	0.391***	0.391***
	(0.101)	(0.101)	(0.101)
University or above	1.257***	1.279***	1.279***
	(0.109)	(0.111)	(0.111)
Household size	-0.0262	-0.0210	-0.0210
	(0.0211)	(0.0211)	(0.0211)
Hours of unpaid care work	0.0129	0.00993	0.00993
	(0.00961)	(0.00920)	(0.00920)
Other income	-0.550***	-0.533***	-0.533***
	(0.121)	(0.120)	(0.120)
Rural region	0.105	0.131*	0.131*
	(0.0700)	(0.0672)	(0.0672)
married	-0.735***	-0.754***	-0.754***
	(0.101)	(0.102)	(0.102)
Perceptions against gender equality	-0.201***	-0.207***	-0.207***
	(0.0672)	(0.0680)	(0.0680)
Constant	-3.291***	-3.306***	-3.306***
	(0.497)	(0.497)	(0.497)
Observations	2,845	2,845	2,845

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

5. Potential mediating channels

Based on our findings, harassment serves as a significant deterrent to women's labor force participation in Egypt. To draw appropriate conclusions and policy recommendations, it is crucial to understand the dynamics through which harassment incidents affect women's behavior in the labor market.

5.1. Harassment effects by women's characteristics

According to classic literature on female labor force participation, women's individual characteristics play a significant role in determining whether they participate in the labor force. Consequently, it is expected that their decision—especially in cases of experiencing harassment—will also be influenced by these individual characteristics given that these same characteristics may affect the likelihood of experiencing harassment. Therefore, it is essential to reanalyze the data by considering different women's characteristics to understand what drives the negative impact of harassment on women's employment.

Three key individual characteristics are examined: marital status, age, and area of residence[7]. **Table 5** highlights the findings based on marital status, with results presented in columns (1) to (4). The analysis reveals that experiencing harassment on the streets or in public transportation significantly impacts married women's decisions to participate in the labor market, whereas it does not significantly affect unmarried women's decisions. Furthermore, focusing on married women shows that their decisions are also influenced by whether their husbands are employed. For example, among married women whose husbands are employed, the effect of experiencing harassment on their labor force participation is negative and statistically significant. In contrast, for married women whose husbands are unemployed, the effect remains negative but is not statistically significant.

These findings can be contextualized within the Egyptian social framework. Zeitoun et al. (2023) found a consensus among women that the men in their lives—whether fathers, brothers, or husbands—play a significant role in determining whether they will participate in the labor force. According to the study, if a man perceives the working conditions to be safe and favorable, he is more likely to approve of a woman's participation in the labor force. This dynamic is more pronounced among married women compared to unmarried women in the current findings. In the same study, 64% of women agreed that working exposes them to harassment, compared to 76% of men. Given these strong perceptions of an unsafe working environment, it is expected that personal experiences of harassment would further decrease the likelihood of labor force participation. Another study by Caria et al. (2023) found that 44% of men believe that women are more exposed to harassment in public spaces when they work, aligning with the results of this analysis.

[7] The empirical analysis is done using the IV methodology using the IV mentioned in section 3.4.

However, when husbands are unemployed, harassment does not have a significant impact on women's labor force participation decisions. In such cases, men may rely on their wives' financial contributions to meet household needs. Therefore, even if harassment occurs, women are less likely to withdraw from the labor force. Zeitoun et al. (2023) reported that the primary driver for women joining the labor force is to provide financial support to their families, as stated by 76% of respondents (both men and women). Additionally, 30% of respondents agreed that men might use their wives' income to support the household. Consequently, when men are unemployed, they are less likely to pressure their wives to leave their jobs, even in cases of harassment.

Table 5: Harassment effects by marital status, IV results, dependent variable (FLFP)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Married	Unmarried	Married	Unmarried	Married & husband is working	Married & husband is not working	Married & husband is working	Married & husband is not working
Street harassment	-1.502***	0.752			-1.622***	-2.289		
	(0.419)	(0.737)			(0.433)	(1.728)		
Transportation harassment			-2.212***	0.516			-2.229***	-3.642
			(0.582)	(0.950)			(0.600)	(2.680)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,479	366	2,479	366	2,245	233	2,245	233

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

Secondly, the analysis is conducted by 10-year age cohorts. **Table 6** shows that the effects of harassment on women's decisions to participate in the labor force become increasingly significant and have a greater magnitude as women age. This aligns with existing literature, which highlights the complexity of studying the relationship between age and violence against women. One challenge is the lack of a universally accepted definition of when a person is considered "old," as this varies across countries and communities. Another issue is the scarcity of data on older age cohorts, which makes them more vulnerable to violence due to the lack of accurate reporting on incidents they face. Data collection efforts often focus disproportionately on women of reproductive age (up to 49 years old), while older women are frequently overlooked (World Bank, 2016; WHO and UN Women, 2024).

This marginalization in data collection and broader discussions, combined with other intersecting dimensions, makes it more difficult for older women to report violence or harassment incidents. Consequently, they may be more inclined to avoid situations where harassment is likely, such as withdrawing from the labor force after experiencing harassment. A report published by the United

Nations (2013) identified several barriers that older women face when considering reporting violence. First, older women often fear a lack of support from their families and children. They may worry about the negative impact such an incident could have on their children if the harassment is publicly acknowledged. Second, these concerns, coupled with self-blame and fear of not being believed—especially given societal perceptions that harassment is less likely to occur to older women—discourage them from reporting incidents.

Given these dynamics, it is understandable that as women age, their labor force participation decisions are increasingly influenced by personal experiences of harassment. Older women may seek to avoid uncomfortable or unsafe situations altogether, leading them to opt out of the labor force when harassment occurs.

Table 6: Harassment effects by age cohort, IV results, dependent variable (FLFP)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<=30	>30 & <=40	>40 & <=50	>50 & <=60	<=30	>30 & <=40	>40 & <=50	>50 & <=60
Street harassment	0.260	-0.983*	-2.143***	-2.560				
	(0.581)	(0.515)	(0.735)	(1.623)				
Transportation harassment					0.313	-1.315*	-2.922***	-5.730**
					(0.786)	(0.743)	(1.070)	(2.385)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	831	1,088	618	308	831	1,088	618	308

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

Third and finally, our results in **Table 7** indicate that the effect of harassment experienced on the streets or in transportation is significant only for women living in urban areas. At first glance, this result may seem counterintuitive. However, Fraser et al. (2017) explain that urbanization presents both opportunities and threats to women. It offers opportunities because traditional gender norms are often more flexible in urban settings, where women's roles evolve to encompass new responsibilities. At the same time, it poses threats as urban environments increase risk factors that heighten the likelihood of violence against women compared to rural areas.

While women in urban areas have greater access to economic and social opportunities, they are also more exposed to risks. For example, slum areas in urban peripheries are associated with higher rates of violence against women. Additionally, urban infrastructure often includes isolated streets with inadequate lighting, discouraging women from commuting long distances, especially during certain times of the day (Mcilwaine, 2013).

In contrast, rural areas generally have smaller, more close-knit communities where families are more likely to know one another. This communal environment can provide a layer of informal social protection, which may influence women's decisions regarding labor force participation. Consequently, the urban setting, with its unique combination of opportunities and risks, significantly shapes women's labor force participation decisions in the face of harassment.

Table 7: Harassment effects by area of residence, IV results, dependent variable (FLFP)

	(1) Urban	(2) Rural	(3) Urban	(4) Rural
Street harassment	-1.056***	-0.578		
	(0.405)	(0.711)		
Transportation harassment			-1.494**	-0.816
			(0.623)	(0.749)
Full set of controls	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
Observations	1,434	1,411	1,434	1,411

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

5.2. Harassment implications on women's employment choices

Another potential mechanism is the impact of harassment on women's employment choices. To explore this, we focus on women who are actively participating in the labor market and examine how harassment influences their choice of employment sector. Our analysis, using Two-Stage Least Squares (2SLS), indicates no endogeneity issues regarding the effect of harassment on women's employment sector choices. Consequently, we employ discrete choice models without instrumental variables for further analysis.

The findings, presented in **Table 8**, reveal that harassment significantly influences women's employment sector decisions. Specifically, women who experience harassment during transportation are more likely to prefer public sector jobs over private sector ones. For many women, the public sector offers greater security, along with shorter and more flexible working hours, which reduce the need for evening commutes when harassment is more likely to occur. Survey responses reveal that most women who reported harassment incidents in transportation indicated these occurred during the evening, further reinforcing the preference for public sector employment, which typically provides more predictable working hours.

In contrast, private sector jobs often require longer working hours and commutes, increasing the likelihood of harassment. This is particularly true for jobs located in metropolitan areas, where transportation security can be a significant concern (Barsoum et al., 2014; World Bank, 2018; Barsoum & AbdAllah, 2020; Barsoum, 2024).

Table 8: LPM and Probit models results by employment sectors

	Public sector				**Private sector**			
	(1) LPM	(2) LPM	(3) Probit	(4) Probit	(5) LPM	(6) LPM	(7) Probit	(8) Probit
Street harassment	NS		NS		Ns		NS	
Transportation harassment		0.13** (0.06)		0.56** (0.26)		-0.13** (0.06)		-0.47** (0.22)
Full set of controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	559	559	559	559	559	559	559	559
F-test (P-value)	30.84 (0.000)	31.41 (0.000)			13.99 (0.000)	14.65 (0.000)		
Wald Chi2 (P-value)			111.23 (0.000)	114.27 (0.000)			88.14 (0.000)	90.42 (0.000)
R-squared	0.34	0.34	0.29	0.30	0.23	0.42	0.19	0.20

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Alam and Bagnoli (2024) discuss the significant challenges Egyptian women face in accessing jobs. They highlighted that only 13% of jobs in Cairo, Egypt's main business hub, are accessible within a one-hour commute. Their study also reported that 35% of women identified the length of trips as the primary challenge in using public transportation in Egypt. Additionally, women typically require an average of two different vehicles to reach their destinations. The Women, Business, and the Law (WBL) index developed by the World Bank provides further insights, showing that Egypt scores 50 in terms of de jure safety legislation but drops to 25 in the de facto enforcement of these laws. Although Egypt has enacted specific legislation targeting sexual harassment as a form of violence against women, it lacks an effective enforcement mechanism for this law.

When combining the insights from the WBL index and the study by Alam and Bagnoli (2024), these findings align with our earlier results regarding women's employment sector preferences. Women recognize that public sector jobs are generally more accessible compared to private sector roles. Furthermore, public sector jobs typically allow women to avoid late-night commutes, which

carry a higher risk of harassment. Given the absence of adequate tools and mechanisms to report harassment incidents, women are more likely to opt out of private sector employment, as explained in our analysis.

Consequently, as Egypt's public sector continues to contract, women increasingly struggle to access the jobs they prefer, pushing them out of the labor force. On one hand, the shrinking public sector, which traditionally provided secure working conditions for women, offers fewer opportunities. On the other hand, the private sector fails to address women's concerns about security, particularly in terms of safe and reliable transportation. This dual challenge is contributing to the continued withdrawal of women from the labor market, echoing broader trends identified by Barsoum (2021) and others, who highlight the difficulties women face in adhering the labor market in Egypt.

6. Conclusion and policy recommendations

Sexual harassment represents a major challenge to women's access to several social and economic opportunities. And, as the government and activists pay more attention to the issue, it is critical to analyze how it may pose a significant barrier to women's economic and social involvement. One of the most significant repercussions is the possible influence on women's economic well-being arising from labor market results.

Therefore, the objective of this paper is to contribute to the economic literature on a threefold basis. First, it highlights the economic costs of a critical problem threatening the gender equality sustainable development goal. Second, it contributes to the existing literature on FLFP in Egypt. Looking back into the existing economic literature, the questions on gender and violence against women were often disregarded, hindering an inevitable discussion on impediments to women's economic and social roles. Thus, it enriches the literature on the determinants of FLFP in Egypt. For decades, several studies have sought to explain the huge gap in labor force participation between males and females in Egypt. And, most of the studies focused on the demographic characteristics that were proven later to be ineffective in explaining the whole disparity. Therefore, it was essential to look into other potential causes including the question of violence. Third, it relates the research question to the transportation literature.

Drawing on data from the Egyptian survey of gender-based violence economic costs, we apply an instrumental variable method to overcome the endogeneity issue. As discussed in previous work of Fajardo-Gonzalez (2021) and Gedikli et al. (2023), endogeneity is induced by several problems including reverse causality between the occurrence of harassment and employment, omitted variables that could intervene with being a victim of harassment as well as the employment probability, and measurement error of our main variable of interest due to under- or mis-reporting in the survey. The findings suggest that exposure to harassment in transportation considerably affects women's labor force participation.

To better understand the factors contributing to this outcome, we examined which groups of women are more likely to withdraw from the labor market due to harassment experiences. The findings indicate that married women, older women, and women residing in urban areas are particularly affected and are more likely to avoid labor market participation as a result of harassment. Additionally, we analyzed how harassment impacts women's employment across different sectors. The results show that heightened security concerns drive women to prefer public sector jobs over private sector roles. Public sector employment offers several advantages, most notably shorter and more flexible working hours compared to the private sector. These conditions allow women to avoid late-night commutes, which are associated with a higher risk of harassment. Moreover, private sector jobs are often concentrated in metropolitan areas, necessitating longer commutes. Without access to safe and reliable transportation, women are less willing to take on such risks, further deterring them from pursuing private sector employment.

Hinging on this paper's analysis, several policy recommendations can be put forward in three main areas. First, the role of the government in infrastructure investments is crucial. The Egyptian government should place greater emphasis on accessible and secure transportation. As highlighted in the literature review and the findings of this paper, women are disproportionately affected by mobility barriers compared to men. Without a well-developed public transport network, women are forced to sacrifice numerous economic opportunities that could enhance their economic well-being. Additionally, improving the infrastructure of public roads, such as ensuring streets are well-lit, can encourage women to take up paid jobs outside their homes by fostering a sense of safety and security.

Second, there is a need to align the de jure laws with their de facto enforcement. As emphasized by the Women, Business, and the Law (WBL) Index (2024), Egypt has established a legislative framework addressing harassment but lacks an effective enforcement mechanism. For example, while specialized units for handling harassment cases have been set up in police stations, insufficient information about their roles limits their impact. Educating women about the functions of these units and how they can provide assistance would encourage more women to report harassment incidents.

Third, stakeholders need to coordinate their efforts to address harassment's negative effects on women's labor force participation. Women often avoid private sector jobs due to long working hours and extended commutes. Private sector firms can address this issue by offering transportation solutions, such as private buses, with costs deducted from salaries. Studies have shown such initiatives to be effective in supporting women's employment. Additionally, NGOs should focus on creating community programs to raise awareness of the detrimental impacts of violence against women. These programs should empower women with tools to confront harassment while engaging men and boys to shift harmful attitudes, as men often perceive public spaces and workplaces as unsafe for women, as highlighted by Zeitoun et al. (2024). This holistic

approach, involving government, private sector, and community efforts, is essential for reducing the barriers harassment poses to women's economic participation.

In a nutshell, this paper proclaims that low levels of FLFP in Egypt are not only driven by supply side distortions or demand side discrimination but also non-suitable environment and infrastructure that hamper women's access to economic opportunities. Despite the contributions of this work, it exhibits some limitations. First, data is only available for only one wave collected in 2015. Any changes in women's employment patterns after 2015 in Egypt is disregarded which is a time period characterized by an undeniable decrease in FLFP in Egypt. Second, due to low variability in the data, we were not able to assess the effects of harassment on other labor market outcomes such as job stability. Third, the dataset has a potential under-reporting problem; as mentioned in the introduction, previous studies showed that harassment rates in Egypt could amount to 40% while they are equal to around 10% in the used dataset. In fact, the issue of the under-reporting is well-known in the literature. Hence, as a conclusion, new waves of data are required to polish the research and to get more accurate results. The ne waves of data should also come in parallel with efforts to encourage women's reporting of such incidents.

7. Appendix

Table A1: Results of the 2SLS 1st stage

	(1) Harassment	(2) Street harassment	(3) Transportation harassment
Harassment rate at governorate level	0.0132***		
	(0.0010)		
Street harassment rate at governorate level		0.0128***	
		(0.00110)	
Transportation harassment rate at governorate level			0.0133***
			(0.0014)
age	0.00541	0.00473	-3.50e-05
	(0.00563)	(0.00501)	(0.00466)
age^2	-0.000129*	-0.000108*	-3.04e-05
	(7.04e-05)	(6.30e-05)	(5.79e-05)
Education: reference group primary education			
Preparatory	0.0451*	0.0229	0.0369*
	(0.0251)	(0.0225)	(0.0198)
Secondary	0.0135	0.000119	0.0330**
	(0.0203)	(0.0179)	(0.0158)
University or above	0.0290	0.0190	0.0408**
	(0.0253)	(0.0229)	(0.0204)
Household size	8.99e-05	-0.00115	0.00464
	(0.00527)	(0.00479)	(0.00451)
Hours of unpaid carework	0.0113***	0.00979***	0.00578***
	(0.00238)	(0.00214)	(0.00189)
Other income	-0.152***	-0.164***	-0.0819***
	(0.0265)	(0.0254)	(0.0219)
Rural region	-0.0596***	-0.0767***	-0.0196
	(0.0165)	(0.0143)	(0.0138)
married	-0.0743***	-0.0779***	-0.0706***
	(0.0263)	(0.0244)	(0.0227)
Perceptions against gender equality	-0.0311**	-0.0362***	-0.0256**
	(0.0155)	(0.0134)	(0.0124)
Intercept	Yes	Yes	Yes
Observations	2,845	2,845	2,845
Kleipergen-Paap F statistic	165.5	130.95	111.33

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

8. References

1. AbdelFattah, A. et al., (2022). "Harassment against female, some facts from Egypt". *The Egyptian Journal of Forensic Sciences and Applied Toxicology*. Vol. 22, No. 1. https://journals.ekb.eg/article_223494_de823309a9e7dd71c841aca1ead22de5.pdf. [Accessed 11th/06/2024].
2. Abul Komsan, N. (2009). "Sexual harassment in the Arab region: cultural challenges and legal gaps". *Findings from the Conference on "Sexual Harassment as Social Violence, and it's Effect on Women".* https://egypt.unfpa.org/sites/default/files/pub-pdf/8655f498-85a0-434e-9396-bfa3b390f63e.pdf. [Accessed 14th/12/2024].
3. Alam, M.M. & Bagnoli, L. (2024) *Ten Thousand Steps in Her Shoes*. Washington, DC: World Bank.
4. Angrsit, J. & Pischke, J. (2008). "Mostly harmless econometrics: An empiricist's companion". https://jonnyphillips.github.io/FLS6415/Class_3/Angrist%20&%20Pischke.pdf. [Accessed 11th/06/2024].
5. Arafa, A. *et al.* (2021) "Psychological correlates with violence against women victimization in Egypt", *International Journal of Mental Health*, 50(1), pp. 78–90. Available at: https://doi.org/10.1080/00207411.2020.1812819.
6. Assaad, R. et al. (2020). "Explaining the MENA paradox: Rising educational attainment yet stagnant female labor force participation". *Demographic Research*. Vol. 43, No. 28, 817-850. DOI: 10.4054/DemRes.2020.43.28.
7. Atallah, M. & Hesham, M. (2024). "Unpaid care work in Egypt: Gender gaps in time use". Economic Research Forum. Working paper No. 1755. https://erf.org.eg/publications/unpaid-care-work-in-egypt-gender-gaps-in-time-use/. [Accessed 14th/12/2024].
8. Barsoum, G. & AbdAllah, D. (2020). "Still the employer of choice: evolution of public sector employment in Egypt". *ERF Working Paper No. 1386*. https://erf.org.eg/app/uploads/2020/08/1598519124_314_349569_1386.pdf. [Accessed 11th/06/2024].
9. Barsoum, G. (2021). "Why is the public sector the employer of choice among women in the Middle East? A gendered qualitative inquiry into PSM in a global context". *Review of Public Personnel Administration*. Vol. 41, No. 4, pages 771-791. [Accessed 11th/06/2024].
10. Barsoum, G. (2024). "Not like father, like son: public sector employment reforms in Egypt". *Review of Public Personnel Administration*. https://doi.org/10.1177/0734371X241227406. [Accessed 11th/06/2024].

11. Barsoum, G. et al., (2014). “Labour market transitions of young women and men in Egypt”. *Work4Youth Publication Series No. 16*. https://webapps.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_247596.pdf. [Accessed 11th/06/2024].
12. Bergenfeld, I. et al. (2021). “Diagnosing norms surrounding sexual harassment at a Jordanian university”. *Frontiers in Sociology*. Vol. 6, 667220. Doi: 10.3389/fsoc.2021.667220.
13. Cameron, A. C., & Trivedi, P. K. (2005)**. “**Microeconometrics: Methods and Applications*”*. *Cambridge University Press*.
14. Caria, A. et al. (2023). “Child Care Subsidies, Employment Services and Women's Labor Market Outcomes in Egypt: First Midline Results”. *Gender Innovation Lab Washington, D.C.: World Bank Group*. http://documents.worldbank.org/curated/en/099556408032227795/IDU04351d87c09e470446808cc90004c6187c47a. [Accessed 14th/12/2024].
15. Chakraborty, T. et al. (2018). “Stigma of sexual violence and women’s decision to work”. *World Development*. 103, 226-238. https://doi.org/10.1016/j.worlddev.2017.10.031.
16. Constant, L. *et al.* (2020). “Barriers to Employment that Women Face in Egypt: Policy Challenges and Considerations”. *RAND Corporation*. Available at: https://doi.org/10.7249/RR2868.
17. Ehab, M. (2018). “The commuting gender gap and female’s labor supply and earnings in the Egyptian labor market”. *Economic Research Forum*. Working Paper No. 1211.
18. Fajardo-Gonzalez, J. (2021). “Domestic violence, decision-making power, and female employment in Colombia”. *Review of Economics of the Household*. Vol. 19, 233-254.
19. Field, E. & Vyborny, K. (2022). “Women’s mobility and labor supply: experimental evidence from Pakistan”. *Asian Development Bank*. Economics Working Paper Series No. 655.
20. Fraser, E. et al. (2017). “Violence against women and girls, infrastructure, and cities”. *Infrastructure and Cities for Economic Development Working Paper*. https://assets.publishing.service.gov.uk/media/5a81bd72ed915d74e33ffcd8/Infrastructure-Cities-briefing-note.pdf. [Accessed 14th/12/2024].
21. Gedikli, C. et al. (2023). “The impact of intimate partner violence on women’s labor market outcomes”. *World Development*. 164, 106166. https://doi.org/10.1016/j.worlddev.2022.106166.
22. Giovanis, E. & Ozdamar, O. (2022). “Intra-household bargaining, resource allocation and cost of gender-based violence in Egypt: The role of asset ownership and gender roles attitudes”. *ERF 29th annual conference working paper*.

https://erf.org.eg/app/uploads/2023/05/1683082274_898_1296027_22erf29ac_gndr_oznur_eleftherios.pdf. [Accessed 14th/12/2024].

23. Graglia, M. (2016). “Finding mobility: women negotiating fear and violence in Mexico city’s public transit system”. *Gender, Place, and Culture*. Vol. 23, No. 5, 624-640. DOI: 10.1080/0966369X.2015.1034240.
24. Halim, D., et al. (2023). “Increasing female labor force participation”. *World Bank Group Gender Thematic Policy Note Series: Evidence and Practice Note*. https://documents1.worldbank.org/curated/en/099439401252337890/pdf/IDU007b0345309ce80494f097fe0ee869b3ae535.pdf. [Accessed 14th/12/2024].
25. Hassan, R. (2020). “Egypt’s sexual harassment problem: encouraging reporting as a possible remedy”. *Arab Barometer*. https://www.arabbarometer.org/2020/03/egypts-sexual-harassment-problem-encouraging-reporting-as-a-possible-remedy-2/. [Accessed on 14th/12/2024].
26. Hassan, R. et al., (2023). “An application to ecological model on sexual harassment in informal areas of Cairo”. *Health Promotion International*. 1;38(4): daab175. doi: 10.1093/heapro/daab175.
27. Hendy, R. (2015). “Women’s participation in the Egyptian labor market: 1998-2021”. *ERF Working Paper No. 907*. https://erf.org.eg/app/uploads/2015/12/907.pdf. [Accessed 11th/06/2024].
28. Jacob, N. et al. (2019). “The disutility of commuting? The effect of gender and local labor markets”. *Regional Science and Urban Economics*. Vol. 77, 264-275. https://doi.org/10.1016/j.regsciurbeco.2019.06.001.
29. Kacharo, D. et al. (2022). “Safety and security of women and girls in public transport”. *Urban, Planning, and Transport Research*. Vol. 10, No. 1, 1-19. DOI: 10.1080/21650020.2022.2027268.
30. Lei, L. et al. (2019). “The Impact of transportation infrastructure on women's employment in India”. *Feminist Economics*. DOI: 10.1080/13545701.2019.1655162.
31. Madden, J. (1980). “Why women work closer to home”. *Urban Studies*. Vol. 18, 181-194.
32. Martinez, D. et al. (2020). “Connecting to economic opportunity: the role of public transport in promoting women’s employment in Lima”. *Journal of Economics, Race, and Policy*. 3, 1-23. https://doi.org/10.1007/s41996-019-00039-9.
33. Marzouk, A. & Vanderveen, G. (2022). “Fighting sexual violence in Egypt on social media: a visual essay on assault police”. *Global Public Health*. Vol. 17, No. 10, pages 2329-2341. https://www.tandfonline.com/doi/epdf/10.1080/17441692.2021.1991972?needAccess=true. [Accessed 11th/06/2024].

34. McIlwaine, C. (2013) 'Urbanization and gender-based violence: exploring the paradoxes in the global South', *Environment and Urbanization*, 25(1), pp. 65–79. Available at: https://doi.org/10.1177/0956247813477359.
35. Nahar, S. & Cronley, C. (2021). "Transportation barriers among immigrant women experiencing intimate partner violence". *Transportation Research Record*. Vol. 2675(9): 861-869.
36. Nazier, H. & Ramadan, R. (2016). "Women's participation in labor market in Egypt: constraints and opportunities" *ERF Working Paper No. 999*. https://erf.org.eg/app/uploads/2016/05/999.pdf. [Accessed 11th/06/2024].
37. Pimkina, S. & De la Flor, L. (2020). "Promoting female labor participation". *World Bank Group*. Jobs Working Paper Issue No. 56.
38. Rios-Avila, F. & Canavire-Bacarreza, G. (2015). "The effect of intimate partner violence on labor market decisions: evidence from a multi-ethnic country". *International Journal of Social Economics*. Vol. 44, No. 1, 75-92. DOI 10.1108/IJSE-12-2014-0258.
39. Roushdy, R. & Sieverding, M. (2015). "Panel survey of young people in Egypt 2014". *Population Council*. https://www.unicef.org/egypt/media/4976/file/2014_Survey_on_Young_People_in_Egypt.pdf. [Accessed 11th/06/2024].
40. Siddique, Z. (2018). "Violence and female labor supply". *IZA Institute of Labor Economics*. Discussion Paper No. 11874.
41. Siddique, Z. (2022). "Media reported violence and female labor supply". *Economic Development and Cultural Change*. Vol. 70, No. 4, 1337-1365. https://doi.org/10.1086/714009.
42. Stewart, S. et al. (2024). "I thought I am better off just trying to put this behind me- a contemporary approach to understanding why women decide not to report sexual violence". *The Journal of Forensic Psychiatry and Psychology*. Vol. 35, No. 1, pages 85-110. DOI: 10.1080/14789949.2023.2292103.
43. Tiznado-Aitken, I. et al. (2024). "Uncovering gender-based violence and harassment in public transport: Lessons for spatial and transport justice". *Journal of Transport Geography*. 114: 103766.
44. UNFPA Egypt. Gender-Based Violence. https://egypt.unfpa.org/en/node/22540 [Accessed on 17th/09/2022]
45. UNFPA, NCW, & CAPMAS. (2015). "The Egypt economic cost of gender-based violence survey 2015". https://egypt.unfpa.org/sites/default/files/pub-pdf/Costs%20of%20the%20impact%20of%20Gender%20Based%20Violence%20%28GBV%29%20WEB.pdf. [Accessed 14th/05/2024].
46. UNICEF & UNFPA. (2022). "Changing the way you see the world". https://www.unicef.org/media/144961/file/Content%20and%20Facilitator%20Guide%20.pdf. [Accessed 05/10/2024].

47. United Nations. (2013). “Neglect, abuse, and violence against older women”. https://www.un.org/esa/socdev/documents/ageing/neglect-abuse-violence-older-women.pdf. [Accessed 14th/12/2024].
48. Wooldridge, J. M. (2010)**.** “Econometric Analysis of Cross Section and Panel Data*”. MIT Press*.
49. World Bank Group. “Women Economic Empowerment Study”. (2018). https://documents1.worldbank.org/curated/en/861491551113547855/pdf/134846-WP-PUBLIC-march-2-WB-Women-Study-EN.pdf. [Accessed 11th/06/2024].
50. World Bank. (2016). “Brief on violence against older women”. https://documents1.worldbank.org/curated/en/995591611122468396/pdf/Violence-Against-Women-and-Girls-Resource-Guide-Brief-on-Violence-Against-Older-Women.pdf. [Accessed 14th/12/2024].
51. World Bank. (2024). Women, Business, and Law Version 2: Egypt Snapshot. https://www.worldbank.org/content/dam/sites/wbl/documents/pilot/2024-nov-14/WBL24_2-0_Egypt-arab-rep.pdf. [Accessed 14th/12/2024].
52. World Bank. Gender-Based Violence. https://www.worldbank.org/en/topic/socialsustainability/brief/violence-against-women-and-girls. [Accessed on 14th/09/2022].
53. World Health Organization & UN Women. (2024). “Violence against women 60 years and older”. https://www.unwomen.org/sites/default/files/2024-03/violence-against-women-60-years-and-older-en.pdf. [Accessed 14th/12/2024].
54. World Health Organization. Violence Against Women. https://www.who.int/news-room/fact-sheets/detail/violence-against-women. [Accessed on 14th/09/2022]
55. Zeitoun, N. et al. (2024). “Social norms and female labor force participation in Egypt”. https://documents1.worldbank.org/curated/en/099061823220039155/pdf/P17968608f6dd00350b350081904da12d91.pdf. [Accessed 14th/12/2024].