

“Be a Man”: Male Unemployment and Sexual Violence

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Abstract

Despite the pervasiveness and severity of sexual violence, the economic literature on its determinants remains limited. This study investigates whether male unemployment contributes to sexual violence in Mexico. Using male unemployment rates obtained from the National Labor Survey, juxtaposed with sexual crime rates reported by the National Public Security System for the years 2015-2019, the analysis employs Ordinary Least Squares regressions with state, year, and quarter fixed effects. The findings reveal that a one percentage point increase in male unemployment corresponds to a 34.2% rise in sexual harassment rates and a 7.2% increase in rape rates, with no discernible impact on sexual abuse. Robustness checks address concerns related to omitted variables, simultaneity, estimator and functional form choices, and changes in reporting rates, especially concerning the rape result. Furthermore, suggestive evidence indicates that the observed effect is not attributable to alterations in relationship dynamics or heightened stress levels. Rather, it appears linked to a backlash against women holding more progressive attitudes. This study stands among the first to comprehensively uncover a positive relationship between male unemployment and sexual violence.

Keywords: male unemployment; sexual violence; backlash; Mexico.

JEL Classification: B54, I15, J16.

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1. Introduction

Globally, in 2018, 30% of women aged 15 or older experienced non-partner sexual violence (6%) and/or physical or sexual intimate partner violence (26%) (WHO, 2021). In Mexico, the lifetime prevalence of violence against women aged 15 and above is 70.1%, with one in every two women experiencing sexual violence (ENDIREH, 2021). The repercussions of sexual violence can extend to severe and enduring mental, reproductive, and physical consequences (Campbell et al., 2009; Jina & Thomas, 2013), potentially leading to compromised outcomes in the labor market (Loya, 2015; Sabia et al., 2013). Additionally, the perceived risk of sexual harassment and assault hinders women's unrestricted and secure mobility, influencing their decisions in education and labor force participation (Borker, 2021; Chakraborty et al., 2018; Siddique, 2022). While various disciplines have explored the roots of sexual violence, including psychological, societal, and cultural factors, the economic literature on this subject remains limited. Nevertheless, certain economic elements may contribute to determining sexual violence prevalence. Specifically, the impact of male unemployment on sexual violence is theoretically ambiguous. On the one hand, it might decrease sexual crimes by reducing social interactions or by translating into improved gender equality. On the other hand, male unemployment could increase sexual violence by reducing males' probability of being in a relationship, exposing women to potential aggressors within their close circles, heightening men's financial stress, and challenging established masculinity norms. Only a few studies have empirically explored the relationship between male unemployment and sexual crimes, yielding mixed results (Caruso, 2015; Raphael & Winter-Ebmer, 2001; Saridakis & Spengler, 2009). Similarly, the literature on a related facet of gender-based violence, encompassing sexual violence among its forms, has acknowledged the relevance of male unemployment in affecting the prevalence of intimate partner violence, albeit in an ambiguous direction (Bhalotra et al., 2021; Aizer, 2010; Anderberg et al., 2016; Tur-Prats, 2021).

This analysis aims to investigate whether male unemployment affects a specific type of crime and form of gender-based violence: sexual violence. It empirically explores the question in the context of Mexico, examining the relationship between the male unemployment rate and the rates of sexual harassment, sexual abuse, and rape, for each state and trimester from 2015 to 2019, through Ordinary Least Squares regressions with state, quarter, and year-fixed effects. Unemployment rates are derived from the National Labor Survey (*Encuesta Nacional de Ocupación y Empleo*), while information on sexual crimes is obtained from the National Public Security System (*Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública*). Additional data sources, including victimization and gender-based violence surveys as well as administrative records on nuptiality and mortality, are then

used to conduct robustness checks and explore the underlying mechanisms driving the observed effects.

The analysis indicates that a 1 percentage-point increase in the male unemployment rate corresponds to a 34.2% (0.134 cases per 100,000 people) rise in sexual harassment rates and a 7.2% (0.235 cases) increase in rape rates, with no discernible impact on sexual abuse rates. These findings withstand various robustness checks, including population weighting, controlling for female unemployment, considering lagged male unemployment, altering variables' functional forms or estimators, excluding one state at a time, and implementing the Oster (2019) bounding approach for omitted variable bias. However, the statistical significance of the sexual harassment result vanishes when incorporating state-specific annual trends, implying that other time-varying state-specific factors may account for variations in this outcome. Additionally, analysis based on the National Victimization Survey (*Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública*) suggests that the main results are not affected by measurement errors or changes in reporting rates, and indicates that an increase in male unemployment contributes to a rise in sexual assaults particularly against women aged 25-34.

The analysis then explores potential mechanisms underlying the observed positive effects on sexual violence, specifically examining the *motivational*, *exposure*, *stress*, and/or *backlash* channels. The *motivational* mechanism suggests an increase in sexual crimes due to the reduced likelihood of unemployed males initiating or sustaining relationships. The *exposure* channel posits that the reduced mobility of unemployed individuals may contribute to an increase in sexual crimes if the perpetrator is a family member or close friend. The *stress* mechanism attributes the rise in sexual crimes to higher psychological and financial stress following job losses, while the *backlash* mechanism sees it as a way of reaffirming the traditional masculine identity threatened by declining job opportunities. Firstly, the impact does not appear to be explained by changes in relationship dynamics, as male unemployment does not influence divorce and marriage rates. Additionally, male unemployment does not impact the rates of male suicide and death from mental or behavioral disorders, suggesting that the *stress* mechanism may not play a significant role in this context. Unfortunately, the *exposure* channel cannot be directly explored due to data limitations, but a heterogeneity analysis based on baseline women's opinions about gender roles provides suggestive evidence supporting the *backlash* channel. Specifically, male unemployment increases sexual crimes only in states where women had more progressive attitudes.

The study contributes to the existing literature in several ways. While prior economic studies have predominantly explored the relationship between overall unemployment and various crime

categories, only a limited number have independently addressed sexual violence or considered the effects of gender-specific labor market opportunities. Notably, studies such as Raphael & Winter-Ebmer (2001) in the USA and Saridakis & Spengler (2009) in Greece found weak evidence that male unemployment increased rape, while female unemployment was linked to a reduction. In contrast, Caruso (2015) identified a positive connection between female unemployment and sexual assaults in Europe, while a decline in male job prospects among youth was associated with an increase in rapes. Therefore, the analysis contributes to the discussion of these studies by extensively exploring the relationship between male unemployment and various types of sexual crimes in a different context. Indeed, Mexico is a middle-income country in Latin America, with possibly different socioeconomic and cultural environments relative to the European and US contexts. Moreover, being among the first to examine specifically the impact of male unemployment on sexual violence, the analysis offers a conceptual framework to comprehend the potential directions of this impact and the underlying mechanisms. In doing so, it integrates insights from economic literature with perspectives from other disciplines. Furthermore, it empirically investigates the relevance of the potential channels identified. Finally, within a broader literature exploring the effects of gender-specific job opportunities on intimate partner violence, which has yielded mixed evidence contingent on factors like bargaining power and male backlash channels (Aizer, 2010; Anderberg et al., 2016; Bhalotra et al., 2021; Tur-Prats, 2021), this study contributes by revealing that male unemployment may induce backlash raising violence against women possibly both within and beyond the confines of the household.

The remainder of the paper is organized as follows. Section 2 provides the theoretical framework linking male unemployment and sexual violence, along with a summary of the empirical evidence on the issue. Section 3 outlines the context of the analysis. Section 4 delves into the discussion of the data used and the empirical strategy adopted. Section 5 presents the primary results, while Section 6 conducts a series of checks to evaluate their robustness. Furthermore, the mechanisms driving the observed effects are explored in Section 6, and Section 7 serves as the conclusion.

2. Literature Review

2.1 Theoretical Literature

The paper delves into the complex relationship between male unemployment and sexual violence. In this section, I outline the conceptual framework underlying the relationship, drawing on insights from economic, evolutionary, and feminist literature. Overall, the effect of male unemployment on sexual violence is theoretically ambiguous, as it may move through various channels. One perspective suggests a potential reduction in sexual crimes due to the *opportunity* or *gender equality* channels. Conversely, male unemployment might contribute to an increase in sexual violence, involving mechanisms such as *exposure*, *motivational*, *backlash*, and/or *stress*. The subsequent section provides detailed explanations for each of these potential channels and Appendix Figure A.1 offers a scheme.

Negative effect of male unemployment on sexual violence

Male unemployment may exert a diminishing effect on sexual violence through two distinct channels: the *opportunity* mechanism rooted in economic literature and the *gender equality* channel drawn from feminist perspectives.

The *opportunity* mechanism emanates from economic considerations, positing that criminal acts require offenders to encounter unguarded targets (Cohen & Felson, 1979). Following this rationale, male unemployment, by reducing social interactions and increasing the presence of individuals in homes or neighborhoods (where protection is more likely), is associated with a decline in crime (Cantor & Land, 1985). This reduction is attributed to a dual impact: the decreased "social activity" of potential perpetrators and the heightened "guardianship" of potential victims, collectively constituting the *opportunity* channel. Importantly, the negative influence of male unemployment on sexual violence through the *opportunity* mechanism specifically applies to crimes in which the offender is typically a stranger to the victim and usually occur in public spaces.

Additionally, drawing from feminist literature, male unemployment may contribute to a reduction in sexual violence through the *gender equality* channel. Indeed, feminist theories, despite their diverse strands, consistently conceptualize sexual crimes as expressions of power, with males seeking dominance rather than satisfying sexual desires (Bevacqua, 2000; Brownmiller, 2005; McPhail, 2016). Consequently, increased male unemployment, by potentially enhancing women's relative status and promoting gender equality, may lead to a decrease in the prevalence of sexual violence (Avakame, 1999; Martin et al., 2006).

Positive effect of male unemployment on sexual violence

However, there is also the possibility that male unemployment increases sexual crimes. The positive direction of this effect may be explained by four potential channels: *exposure*, *motivational*, *backlash*, and/or *stress*.

Firstly, the *exposure* mechanism serves as the counterpart to the *opportunity* channel in crimes where the perpetrator is typically a family member or a known individual residing nearby. In these scenarios, the reduced social activities and mobility of the unemployed may lead to an increased opportunity for offenders to commit the crime or, concurrently, heightened exposure of victims to potential perpetrators (Cantor & Land, 1985). Therefore, to differentiate between cases where the channel is associated with a reduction or increase in sexual violence, it is termed the "*opportunity*" channel when related to a decrease and the "*exposure*" channel when linked to an increase. The relevance of the contrasting mechanisms would hinge on the specific characteristics and relationships between victims and perpetrators prevalent in each crime category. For instance, sexual harassment often involves perpetrators who are strangers to the victims and occurs commonly in public spaces, while the opposite tends to be true for rapes¹. This consideration suggests that the *opportunity* channel is likely to be more significant in the case of sexual harassment, whereas the *exposure* channel may be more influential in instances of sexual assaults.

Secondly, the *motivational* channel is rooted in a long-history economic perspective but is adapted to the context of this analysis through evolutionary theories. Indeed, the positive link between unemployment and crime has been extensively hypothesized in the economic and social science literature, grounded in the rational choice perspective that posits lower economic status implies reduced opportunity costs for engaging in illegal activities rather than legal ones (Becker, 1968). However, this literature predominantly addresses property crimes, requiring an adaptation when examining violent crimes, particularly sexual offenses. As a matter of fact, the criminal act in question lacks an economic reward, diminishing the relevance of the *motivational* channel. However, evolutionary theories introduce an alternative interpretation of the mechanism, suggesting that rape may represent a direct or indirect adaptation of a strategy evolved to enhance men's reproductive success (Thornhill & Palmer, 2000). Accordingly, if unemployment diminishes males' prospects of finding a partner or sustaining a relationship (for instance, decreasing their marriage opportunities

¹ Based on data from the Mexican National Victimization Survey (*Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública - ENVIPE*), 77% of victims of harassment, fondling, indecent exposure, or attempted rape reported not knowing the perpetrator, even by sight, and more than five-sixth that the crime happened in the street, public transport, or public place (ENVIPE, 2016-2019). Conversely, one in every two rape victims indicated that the perpetrator was a close friend or family member, with only one-fourth reporting the assailant as a stranger. Parallely, half of the rapes happened in a house, 11% at the workplace, and 27% in the street.

and/or increasing their likelihood of engaging in a divorce), there could be a "*motivational*" upswing in rapes. In this case, the perceived reward from the criminal act is sexual intercourse and reproductive possibilities, a concept also known as the "mate deprivation hypothesis" (McKibbin et al., 2008)².

Thirdly, feminist theories propose a contrasting mechanism to the *gender equality* channel mentioned earlier: the *backlash* channel, suggesting a positive relationship between male unemployment and sexual violence (Avakame, 1999; Martin et al., 2006)³. In societies characterized by a widespread male breadwinner norm, a decline in job opportunities for men could challenge their sense of identity. This may elevate frustration levels, leading to a heightened propensity for engaging in violent behaviors. Considering that societal norms regarding one's gender influence behavior (Akerlof & Kranton, 2000), in communities where "masculinity" is deeply perceived in terms of power and authority, unemployment may pose a threat to men's sense of identity, and violence - including sexual misconduct - may be seen as a way of reaffirming it (Bosson et al., 2009). Therefore, the *backlash* mechanism is more likely to emerge where men hold less gender-equal opinions or, conversely, where women are more progressive, intensifying the perceived threat to masculine identity.

Lastly, the economic literature on domestic violence against women introduces another potential motive applicable to the context of interest: the *emotional cue* or *stress* hypothesis (Bhalotra et al., 2021; Card & Dahl, 2011; Diaz & Saldarriaga, 2023). The premise suggests that job loss may elevate psychological and financial stress, diminishing emotional and impulse control and/or escalating alcohol and drug consumption, potentially increasing sexual violence. Notably, the *backlash* and *stress* hypotheses can be interconnected and challenging to differentiate: psychological stress due to unemployment may be more pronounced where the male breadwinner norm prevails, while financial stress is heightened if the man is the primary household provider (Bhalotra et al., 2021; Diaz & Saldarriaga, 2023).

In summary, the impact of male unemployment on sexual violence is theoretically ambiguous, moving through different channels derived from various strands of economic and other disciplines' literature. On the one hand, it may reduce sexual crimes due to the *opportunity* or *gender equality*

² However, it's essential to note that evolutionary theories, including this hypothesis, have encountered significant criticism, and the empirical support for such propositions is generally weak (Coyne & Berry, 2000; Smith et al., 2001; Vandermassen, 2011; Ward & Siegert, 2002). Recently, Singh and Vincent (2023) demonstrated that a forced sterilization program in India resulted in a 22% increase in the rape rate, contradicting the predictions of evolutionary theories. Additionally, this channel would apply only to the case of sexual assaults and not to other types of sexual crimes.

³ Note that the contrasting channels derived from feminist theories parallel the "*bargaining*" and "*backlash*" hypotheses of economic models on the relationship between gender-specific unemployment and intimate partner violence (Bhalotra et al., 2021; Aizer, 2010; Anderberg et al., 2016; Tur-Prats, 2021). However, the feminist literature extends the economic "*bargaining*" mechanism into a "*gender-equality*" channel at the societal level, potentially reducing violence against women beyond the household context.

mechanisms. On the other hand, it may increase sexual violence through *motivational*, *exposure*, *backlash*, or *stress* channels. The prevailing effect and the relevant underlying mechanisms are empirical questions and would depend, among other factors, on the specific kind of sexual crime⁴.

2.2 Empirical Literature

The empirical evidence on the unemployment impact on crime is mixed, reflecting the contrasting underlying mechanisms at play. Concerning non-violent-crimes, such as burglary, larceny, and fraud, the estimated effects are generally positive (unemployment increases non-violent crimes), despite variations in contexts, data sources, and empirical methodologies (Altindag, 2012; Buonanno, 2006; Carmichael & Ward, 2001; Edmark, 2005; Fougere et al., 2009; Gould et al., 2002; Jawadi et al., 2021; Oster & Agell, 2007; Raphael & Winter-Ebmer, 2001; Saridakis & Spengler, 2009; Wu Wu, 2012). Some suggest short-term negative effects due to the *opportunity* channel but tend to become positive in the long run due to the economic incentives derived from illegal activities (Andresen, 2012; Britt, 1994; Cantor & Land, 1985; Janko & Popli, 2015). However, for violent crimes, such as murder, assault, and rape, where there is no such economic return, the evidence typically suggests an indiscernible impact (Cantor & Land, 1985; Edmark, 2005; Gould et al., 2002; Janko & Popli, 2015; Jawadi et al., 2021; Raphael & Winter-Ebmer, 2001; Saridakis & Spengler, 2009; Wu Wu, 2012). This holds when examining the effect of youth unemployment, usually considered more prone to criminal activity (Carmichael & Ward, 2001; Fougere et al., 2009; Oster & Agell, 2007).

A limited number of studies have specifically examined the impact on rape and none has included other forms of sexual violence beyond rape. Furthermore, very few papers have examined the separate effects of gender-specific unemployment rates. However, these differentiations are critical given the distinct characteristics of sexual crimes, where offenders and victims are almost exclusively defined based on gender⁵. The findings on the overall impact of unemployment on rape prevalence are inconclusive. Some studies did not yield significant results (Cantor & Land, 1985; Edmark, 2005; Fougere et al., 2009; Wu Wu, 2012), while others reported negative effects (unemployment reduces rape), attributed to the *opportunity* channel (Altindag, 2012; Britt, 1994; Raphael & Winter-Ebmer, 2001; Saridakis & Spengler, 2009). Only Caruso (2015) identified a positive correlation in Europe.

Among the referenced studies, just three have undertaken the analysis considering gender-specific unemployment rates. Raphael & Winter-Ebmer (2001) utilized annual US state-level data from 1971

⁴ See the Appendix Figure A.1 for a scheme of the possible channels underlying the relationship between male unemployment and sexual harassment, sexual abuse, and rape.

⁵ For instance, in Mexico, around 99% of sexual assault perpetrators are males and around 90% of the victims are females (ENVIPE, 2016-2019). Moreover, note that, throughout the paper, I am interchangeably using the terms “gender”-“sex”, “men”-“males”, “women”-“females”, due to the impossibility of distinguishing gender and sex in the data.

to 1997, employing Ordinary Least Squares with fixed effects and Instrumental Variable strategies. Their findings indicate that, if anything, female unemployment decreased sexual assaults, while male unemployment increased them. However, the results are weak, since the statistical significance of the coefficients strongly depends on the model specification. In particular, controlling for female unemployment, a one-percentage-point increase in male unemployment significantly raises the rape rate by 1.65% in the specification with state and year fixed effects, but the coefficient decreases to 0.41% losing its statistical significance with states' linear trends. In general, the authors argue that the weak observed negative effect of total unemployment is masking gender-specific dynamics and is influenced by the *opportunity* mechanism, as the negative relationship between female unemployment and rape cannot be explained by changes in offenders' behavior but rather by alterations in interpersonal exposure. Saridakis & Spengler (2009) employed a first-differenced Generalized Method of Moments estimator using data from 13 Greek regions spanning from 1991 to 1998. Similar to Raphael & Winter-Ebmer (2001), they found that total unemployment decreases rapes. However, when gender-specific unemployment rates were considered, the effect had a negative sign for females, with an elasticity of -0.74, and a positive one for males: a 1% increase in male unemployment raised the rape rates by 0.53%. As with the previous study, the authors explained the negative result of female unemployment as a consequence of women's lower exposure to potential offenders but did not provide a detailed explanation for the positive effect of male unemployment. Lastly, Caruso (2015) used police records for an unbalanced panel of 60 European regions from 2000 to 2011, employing Ordinary Least Squares and Negative Binomial regressions with fixed effects. In contrast to the two prior studies, Caruso (2015) observed a positive association between both total and female unemployment and rape, with an estimated elasticity of 0.26 for the latter. The coefficient for male unemployment was also positive, but not statistically significant. Notably, when focusing on youth unemployment (aged 15-24), the result was significant only for males: a 1% rise in youth male unemployment is associated with a 0.17% increase in sexual assaults. The author concluded that the *opportunity* channel does not hold for the crime of rape. However, Caruso (2015) did not include both male and female unemployment in the regression. Furthermore, similar to the other studies, he did not extensively investigate the underlying mechanisms driving the findings. Finally, all three mentioned papers did not consider the potential reverse causality regarding the female unemployment results (Borker, 2021; Chakraborty et al., 2018; Sabia et al., 2013; Siddique, 2022).

Additional insights can be drawn from the economic literature on intimate partner violence (IPV), which includes sexual violence as a subset. Moreover, both IPV and sexual crimes can be interpreted as manifestations of gender-based violence, and thus they may be affected by similar mechanisms adapted to their specific contexts. Existing literature on unemployment and IPV consistently reveals

null effects of total unemployment while indicating differentiated impacts of gender-specific unemployment (see Clerici & Tripodi (2021) for an extensive literature review). Studies by Aizer (2010) in the USA and Anderberg et al. (2016) in the UK found that decreases in wages or job opportunities for females increased IPV, while the opposite was observed for males. This aligns with the household bargaining model, where enhanced labor market prospects for women relative to men augment their outside options and reduce violence. While this model cannot be directly applied to sexual crimes due to the absence of bargaining powers and threat points, it may have relevance to the feminist *gender equality* mechanism⁶. However, Bhalotra et al. (2021), utilizing data from 31 developing countries, presented contrasting results. In societies where cultural or legal barriers hinder women's access to divorce, male unemployment was associated with an increase in IPV, whereas female unemployment was linked to a reduction. This study suggests that, in the absence of tangible threat points, the *stress* and male *backlash* channels may be predominant. In Spain, Tur-Prats (2021) demonstrated that the direction of the IPV effect resulting from changes in relative unemployment depends on gender norms derived from historical family structures. In regions with more gender-equal norms, the effects align with the bargaining model. Conversely, in areas where the male breadwinner stereotype is more pronounced, male unemployment increases IPV, while female unemployment reduces it, providing support for the *backlash* hypothesis.

In conclusion, there is limited empirical evidence regarding the impact of male unemployment on sexual crimes. The economic literature has predominantly concentrated on the relationship between overall unemployment and crime, while few studies have explored rape independently and considered gender-specific labor market opportunities. Raphael & Winter-Ebmer (2001) in the USA and Saridakis & Spengler (2009) in Greece found weak evidence that male unemployment increases rapes. In Europe, Caruso (2015) did not find significant effects considering total male unemployment, while a decrease in male job prospects among youth is linked to an increase in rapes. Nevertheless, these outcomes were not the primary emphasis of the studies and, consequently, the findings and potential mechanisms were not thoroughly examined. Finally, a broader body of literature indicates that higher male unemployment relative to females diminishes intimate partner violence (IPV). Nevertheless, in contexts where credible threat points are absent and/or conservative gender norms prevail, the effect reverses. These findings suggest potential channels through which male unemployment may impact violence against women within and beyond the household and underscore the relevance of considering factors at the community and societal levels.

⁶ See Martin et al. (2006) for a review of the feminist and sociological empirical evidence on the *gender equality* and *backlash* hypotheses. Generally, the evidence is mixed, similarly to the economic literature.

3. Context

Mexico, or *Estados Unidos Mexicanos*, is a federation comprising 31 states along with the federal district of Mexico City. Throughout the years 2015-2019, the country witnessed a decrease in the unemployment rate from 4.3% to 3.4%, consistently maintaining levels below the Organization for Economic Co-operation and Development (OECD) countries' average, albeit with a less substantial decline (OECD, 2023). Female unemployment slightly exceeds male unemployment (see the 2015-2019 evolution in Appendix Figure A.2). However, there exists considerable variation in unemployment rates among states, ranging from Guerrero with an average of 1.7% to Tabasco with 7.1% (ENOE, 2015-2019). The prevalence of labor informality, representing individuals vulnerable in terms of employment or with unrecognized labor dependencies, stood at approximately 57% during the specified timeframe (ENOE, 2015-2019). Lastly, a distinctive feature of the Mexican labor market, setting it apart from other OECD countries, is the absence of unemployment benefits.

Mexico is ranked 31st in the 2022 Global Gender Gap Index, measuring gender parity across economic, health, education, and political dimensions, and it is 4th in the Latin America and Caribbean region (WEF, 2022). However, the country grapples with pervasive violence against women. A 2021 representative survey on gender-based violence revealed that 70.1% of women in Mexico have experienced at least one form of psychological, physical, sexual, economic, or patrimonial violence during their lifetime (ENDIREH, 2021). There is substantial variation across states, ranging from 48.7% in Chiapas to 78.7% in the State of Mexico. Sexual violence ranks as the second most common form, with one in two women having experienced it, especially affecting younger, more educated, or single women. Moreover, the percentage of women who have suffered sexual violence has increased relative to the 2016 round of the survey (ENDIREH, 2021). This pattern is confirmed by the data of the National Public Security System (*Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública*), showing growing numbers of preliminary inquiries and investigation files for sexual crimes over the time frame of the analysis (see the 2015-2019 evolution in Appendix Figure A.3).

The definition of sexual violence in Mexico derives from the General Law on Women's Access to a Life Free from Violence (*Ley General de Acceso de las Mujeres a una Vida Libre de Violencia*, 2007). It defines sexual violence as: “any act that degrades or damages the body and/or sexuality of the Victim and therefore violates her freedom, dignity and physical integrity. It is an expression of abuse of power that implies male supremacy over women, denigrating them and conceiving them as objects” (LGAMVLV, 2007). The specific categories and corresponding sanctions may vary as it is the responsibility of each state to define them in their Penal Codes. However, the considered crimes are generally similar, encompassing sexual harassment, sexual abuse, and rape, among others.

Furthermore, Mexico suffers from extensive impunity regarding sexual violence. In 2021, there were an average of 243 rapes per day in the country (Giles Navarro, 2023). However, very few individuals were imprisoned for sexual crimes in that year: for every 157 sexual crimes, only one person was sentenced to prison. The low reporting rate contributes to this figure. Indeed, the National Victimization Survey (*Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública*) indicates that only 30% of women who experienced sexual assaults reported it to the authorities, dropping to 10% for sexual violence other than rape (ENVIPE, 2016-2019). Due to the widespread nature of sexual and gender-based violence, the Mexican Congress has recently enacted new laws and is deliberating on others (Giles Navarro, 2023). Notably, preventive prison for child sex offenders has been ratified, the crime of digital violence has been officially recognized, and individuals convicted of gender-based violence crimes are now barred from holding public offices. Additionally, the Chamber of Deputies and Senate are presently in discussions regarding proposed laws that aim to redefine rape by focusing on the absence of the victim's consent, considering the introduction of chemical castration as a penalty for rapists, and eliminating the statutory rape crime's prescription. Nevertheless, a debate exists on the appropriateness and legality of employing chemical castration as a measure to combat sexual violence (Núñez Trejo, 2018). At the same time, many advocate for cultural and institutional changes to diminish the prevalence of sexual crimes, address impunity, and elevate reporting rates.

4. Data and Empirical Strategy

4.1 Data

To investigate the effect of male unemployment on sexual violence in Mexico, I use two main data sources: the National Labor Survey and the National Public Security System data. The National Labor Survey, or *Encuesta Nacional de Ocupación y Empleo* (ENOE), is a quarterly continuous survey⁷, representative at the national and state levels, collecting information on Mexico's labor force and employment conditions of people 15 years old or older. A person is considered employed if he or she has worked – formally or informally - at least one hour during the previous week, while is considered unemployed if he or she was looking for a job in the preceding month. If the person has not looked for a job during the previous month and was not available to work during the preceding week, is considered as not economically active (see the Appendix for the precise definitions).

Data on sexual violence derives from the National Public Security System (*Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública* or NPSS). It contains monthly and municipality-level data on the initiations of preliminary inquiries and/or openings of investigation files reported by the Attorney General's Offices and General Prosecutors of the 32 federal states for the years from 2015 to 2022 (del Sistema, 2008). The date refers to the initiation of the preliminary inquiry or opening of the investigation file, while the location refers to the municipality or delegation where the crime occurred. The NPSS homologates the information to overcome the possible different crime' definitions established by each state's Penal Codes or laws. In particular, in the analysis, I consider three types of sexual violence: sexual harassment, sexual abuse, and rape⁸. Sexual harassment includes unwanted sexual advances or conduct that jeopardizes a person's well-being and dignity. Sexual abuse indicates engaging in a sexual act without the other person's consent and without the intent of intercourse, while rape involves non-consensual sexual intercourse, committed with physical or psychological violence or targeting individuals unable to understand or resist the act (see the

⁷ In the ENOE, 80% of the sample remains constant each quarter, with 20% refreshed, and the sample is divided into five rotation panels. Each household lasts for five quarters before being replaced, and they are visited once per quarter.

⁸ The NPSS includes an additional form of sexual crime: sexual harassment in hierarchical relationships, referring to unwanted sexual behaviors perpetrated by someone in a position of authority. Given the specificity of this crime, which mostly takes place in the work environment, the channels at play could be different. As increases in male unemployment reduce women's exposure to job-related perpetrators, the *exposure* channel is entirely replaced by the *opportunity* one, and the *stress* mechanism does not apply. However, the risk of endogeneity is higher for this crime, since victims may quit or change jobs and offenders may be fired as a consequence of sexual harassment (Adams-Prassl et al., 2023; Batut et al., 2021; Folke & Rickne, 2022). Therefore, I do not include sexual harassment in hierarchical relationships in the main analysis, but the results for this outcome are shown in Appendix Table A.2, jointly with the results for other forms of gender-based violence not included in the study (domestic violence and femicides). Male unemployment does not seem to affect any of these additional outcomes.

Appendix for the exact definitions). Unfortunately, the NPSS does not contain information on the victims' or aggressors' demographic characteristics⁹.

Finally, in the robustness checks and analysis of mechanisms, I use other data sources, such as the National Victimization Survey (*Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública* - ENVIPE), the National Survey on Household Dynamics (*Encuesta Nacional sobre la Dinámica de las Relaciones en los Hogares* – ENDIREH), and the National Institute of Statistics and Geography (INEGI) administrative records on nuptiality and mortality.

The male and female unemployment rates are constructed as the number of unemployed of that gender over the number of economically active males or females, by state and trimester, per 100. Then, the NPSS's data is modified by adding the number of sexual violence acts by state and trimester to construct each crime's rate per 100,000 inhabitants, where the population data comes from Mexico's National Population Council (CONAPO)¹⁰. As mentioned, I have information on the 32 states' sexual violence and male unemployment for the 4 trimesters of the years between 2015 and 2022. However, the state of Oaxaca does not have complete data on crime for the years 2015 and 2016, thus it is excluded for these two years. Moreover, in 2020 the COVID-19 pandemic spread around the world, reaching Mexico, and potentially affecting both the variables of interest and the way the data was collected. Because of this reason, the analysis is performed considering the years up to 2019. The final sample includes 632 state-trimester observations.

Table 1 provides the descriptive statistics for the main variables used in the analysis. The average male unemployment by state and trimester during the period 2015-2019 is 3.54, while female unemployment is slightly higher. The standard deviation of male unemployment is 1.19, with a minimum of 0.74 and a maximum of 8.09¹¹. Figure A.2 in the Appendix shows the evolution of male and female unemployment rates: they have decreased in a non-monotonic way during the time frame of the analysis. Considering sexual violence, the most common form is sexual abuse (3.41 cases per trimester per 100,000 inhabitants), followed by rape with 3.25 cases, while the number of preliminary inquiries or investigation files per 100,000 inhabitants of sexual harassment is lower (0.39). Finally, Appendix Figure A.3 indicates that all the types of sexual violence increased from 2015 to 2019.

⁹ However, since in Mexico about 99% of sexual assault perpetrators are males and 90% of the victims are females, throughout the paper it is assumed that sexual violence is perpetrated by males against females, as it is in the vast majority of cases (ENVIPE, 2016-2019).

¹⁰ See the Appendix for the definition and construction (Table A.1) of all the variables used in the analysis.

¹¹ State, year, and quarter fixed effects explain 83% of the variation in male unemployment during the time frame considered. Therefore, the remaining 17% is what is exploited by the identification strategy below presented.

Table 1. Descriptive statistics

	Mean	SD	Min	Max	N
Male Unemployment	3.540	1.188	0.742	8.087	632
Female Unemployment	3.726	1.316	1.021	8.479	632
Harassment	0.392	0.584	0	5.141	632
Abuse	3.406	2.657	0	12.084	632
Rape	3.250	1.810	0.223	9.842	632

Notes: The Table shows summary statistics for the state-trimester observations for the period 2015-2019. The unemployment rates are constructed as the number of people unemployed over the number of people economically active, per 100, using data from the National Labor Survey (ENOE). The sexual violence rates are constructed as the number of crimes per 100,000 inhabitants, using information from the National Public Security System (NPSS).

4.2 Empirical strategy

The paper aims to explore the relationship between male unemployment and sexual violence in Mexico. To do so, I estimate Ordinary Least-Squares (OLS) regressions with fixed effects, relating the state's male unemployment rate with the local rates of sexual crimes. In particular, I estimate the following equation:

$$SViol_{sty} = \alpha + \beta MUNempl_{sty} + \sigma_s + \rho_t + \lambda_y + \varepsilon_{sty} \quad (1)$$

where $SViol_{sty}$ is the outcome of interest (sexual harassment, sexual abuse, and rape rates per 100,000 inhabitants for state s in trimester t and year y) and $MUNempl_{sty}$ represents the male unemployment rate for state s in quarter t and year y . The state fixed effects (σ_s) account for time-invariant heterogeneities across states, the trimester fixed effects (ρ_t) consider possible seasonality in both unemployment and crime rates, and the year fixed effects (λ_y) capture annual aggregate trends. Therefore, the parameter of interest, β , represents the average effect of a one-percentage-point increase in male unemployment on sexual violence. The impact is identified through the analysis of variations in male unemployment and sexual violence rates within each state across different quarters and years while accounting for time-invariant state characteristics, yearly trends, and seasonality. The equation is unlikely to suffer from reverse causality, while other possible threats to the coefficient's causal interpretation, such as omitted variables, simultaneity, or measurement errors, are further discussed in the robustness checks. Finally, the standard errors (ε_{sty}) are clustered at the state level to account for potential correlations within states. However, considering that Mexico comprises 32 states and that the rule-of-thumb for the validity of this inference procedure requires at least 50 clusters, the statistical significance of the coefficients is marked according to the p-values computed with wild-cluster bootstrapping, as suggested by Cameron et al. (2008) for dealing with a small number of clusters.

5. Results

The study explores the impact of male unemployment on sexual violence in Mexico. Table 2 presents the main results, associating the state's quarterly male unemployment rate with rates of sexual harassment, sexual abuse, and rape, while incorporating state, quarter, and year-fixed effects, for the years from 2015 to 2019. Column 1 indicates that, for a 1 percentage-point increase in the male unemployment rate, the rate of sexual harassment rises on average by 0.134 cases per 100,000 people, equivalent to a 34.2% increase relative to the sample mean, all other things being equal. This finding is statistically significant at the 1% confidence level. Conversely, the male unemployment rate does not appear to have a significant effect on the rate of sexual abuse in Column 2. Finally, a 1 percentage-point increase in male unemployment is linked to a rise of 0.235 in the rape rate, corresponding to a 7.2% increase compared to the average for the years 2015-2019 (Column 3). This result is significant at the 5% level, with a wild-cluster bootstrap p-value of 0.016. The sexual assault finding is thus in line with those of Caruso (2015), Raphael & Winter-Ebmer (2001), and Saridakis & Spengler (2009), who similarly observed a positive – even if not always statistically significant - relationship between male unemployment and rape rates in Europe, USA, and Greece, respectively.

Table 2. Effect of Male Unemployment on Sexual Violence

	(1) Harassment	(2) Abuse	(3) Rape
Male Unemployment	0.134 ^{***} (0.042)	0.021 (0.108)	0.235 ^{**} (0.088)
Observations	632	632	632
Mean	0.392	3.406	3.250
Adj. R-sq	0.587	0.816	0.735
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes

Notes: The Table presents the impact of male unemployment on the rates of sexual harassment, sexual abuse, and rape. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Sexual violence rates represent the number of crimes per 100,000 inhabitants, utilizing information from the National Public Security System (NPSS). Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Nevertheless, as highlighted earlier, the baseline analysis and the causal interpretation of the estimated coefficients may face challenges from factors like omitted variables, misspecification of functional forms, measurement errors, and simultaneity, among others. Consequently, it is essential to perform additional tests to enhance confidence in the causal interpretation of the observed relationship.

6. Robustness Checks

The baseline model indicates that male unemployment rates increase sexual harassment and rape rates. To assess the robustness of the findings, a series of checks are conducted, among which: population weighting, controlling for female unemployment, considering lagged male unemployment, excluding Mexico City and one state at a time, including state annual trends, implementing the Oster (2019) bounding approach for omitted variable bias, altering the variables' functional forms or the estimator, and conducting the analysis using data from the National Victimization Survey (*Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública*). The results of the main checks are presented in Table 3 for sexual harassment and Table 4 for rape¹².

Table 3. Robustness checks: Sexual Harassment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male Unemployment	0.134*** (0.042)	0.149*** (0.046)	0.141*** (0.038)	0.120*** (0.042)		0.116*** (0.040)	0.077 (0.071)	[0.052, 4.121]
Female Unemployment			-0.025 (0.032)					
Lagged Male Unemployment					0.097*** (0.035)	0.067** (0.033)		
Observations	632	632	632	612	632	632	632	632
Mean	0.392	0.392	0.392	0.372	0.392	0.392	0.392	0.392
Adj. R-sq	0.587	0.582	0.587	0.592	0.581	0.589	0.845	0.587
Pop. Weights	No	Yes	No	No	No	No	No	No
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Trim FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	No	No	No	No	No	No	Yes	No
CDMX	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Notes: The Table presents the robustness checks for the effect of male unemployment on sexual harassment. The outcome variable is the number of sexual harassment investigation files per 100,000 inhabitants, per state and trimester, for the years 2015-2019, utilizing information from the National Public Security System (NPSS). Male and female unemployment rates are the state's same-quarter number of unemployed over the economically active population of the same sex per 100, while the lagged male unemployment refers to the previous quarter, constructed using data from the National Labor Survey (ENOE). "Pop. Weights" refers to the use of the state's annual population as weight in the analysis. "State FE", "Year FE", "Trim FE", and "State-Year FE" refer to the inclusion of state, year, trimester, and state*year fixed effects, respectively. "CDMX" stands for Mexico City. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

¹² The robustness checks for sexual abuse are displayed in Table A.3 in the Appendix.

The basic results are shown in Columns (1) of Tables 3 and 4, while in Columns (2) population weights are introduced. The main analysis omits population weights due to debates on their appropriateness in causal inference (Lee & Solon, 2011; Solon et al., 2015)¹³, but it is considered good practice to compare the results with and without weights since major differences may be a sign of model misspecification. Reassuringly, the results with weights (Column 2) align closely with those of the main specification (Column 1), indicating similar magnitude and significance of the effects¹⁴.

Table 4. Robustness checks: Rape

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male	0.235**	0.219**	0.198**	0.201**		0.198**	0.171*	[0.055,
Unemployment	(0.088)	(0.105)	(0.087)	(0.086)		(0.080)	(0.093)	6.134]
Female			0.137					
Unemployment			(0.123)					
Lagged Male					0.189*	0.137		
Unemployment					(0.104)	(0.093)		
Observations	632	632	632	612	632	632	632	632
Mean	3.250	3.250	3.250	3.276	3.250	3.250	3.250	3.250
Adj. R-sq	0.735	0.798	0.736	0.740	0.733	0.736	0.894	0.735
Pop. Weights	No	Yes	No	No	No	No	No	No
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Trim FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	No	No	No	No	No	No	Yes	No
CDMX	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Notes: The Table presents the robustness checks for the effect of male unemployment on rape. The outcome variable is the number of rape investigation files per 100,000 inhabitants, per state and trimester, for the years 2015-2019, utilizing information from the National Public Security System (NPSS). Male and female unemployment rates are the state's same-quarter number of unemployed over the economically active population of the same sex per 100, while the lagged male unemployment refers to the previous quarter, constructed using data from the National Labor Survey (ENOE). "Pop. Weights" refers to the use of the state's annual population as weight in the analysis. "State FE", "Year FE", "Trim FE", and "State-Year FE" refer to the inclusion of state, year, trimester, and state*year fixed effects, respectively. "CDMX" stands for Mexico City. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

¹³ Weighting is sometimes used as a way to correct heteroskedastic error terms. However, this possibility is already taken into account in the analysis by computing heteroskedasticity-robust standard errors clustered at the state level. In this case, estimates from Ordinary Least Squares regressions may be more precise than those from Weighted Least Squares (Lee & Solon, 2011). Moreover, one may want to weigh to identify the population average partial effects, but WLS estimates could not be the answer. Indeed, suppose the model is misspecified, failing for instance to take into account some heterogeneous effects. In that case, both OLS and WLS estimators are inconsistent and none is better than the other (Solon et al., 2015).

¹⁴ The estimated coefficients remain largely unchanged also if introducing the annual state's population as a control variable rather than as weight (results upon request).

In the second test, a potentially significant omitted variable, female unemployment, is incorporated (Column 3). Although omitted from the basic specification due to concerns of multicollinearity and endogeneity, its inclusion does not substantially alter the estimates of male unemployment. Moreover, its coefficients are not statistically significant but point to a negative direction in the case of sexual harassment and to a positive one in the case of rape, similar to what was observed by Caruso (2015) but differently from Saridakis & Spengler (2009) and Raphael & Winter-Ebmer (2001)¹⁵. The subsequent test involves excluding Mexico City, a common practice in Mexican analyses, given its unique characteristics. Indeed, the city, beyond being vastly populated, generally differs from the rest of the country in terms of both crime rates and economic performances and policies. Omitting Mexico City (Column 4) slightly reduces the magnitude of estimated effects but does not alter the main results¹⁶. The following two tests focus on the previous quarter's male unemployment¹⁷. Column (5) introduces the lagged independent variable instead of the contemporaneous to address concerns of simultaneity. The effect of the preceding quarter's male unemployment remains positive, even if of a smaller magnitude, on both outcomes. Column (6) includes both lagged and contemporaneous male unemployment rates to account for the potential dynamics and persistence of the effects. This introduces a risk of multicollinearity but reveals that male unemployment seems to have both immediate and lagged positive impacts on sexual harassment rates, while it has only contemporaneous effects on rape rates. Column (7) introduces state-per-year fixed effects to account for unobserved state-specific factors that may be correlated with unemployment and sexual violence and vary yearly, such as states' judicial and police responses to changes in employment and crime levels (Tur-Prats, 2021). For sexual harassment, the positive effect persists but loses statistical significance, suggesting that other state-specific changes may explain variations in sexual harassment rates rather than male unemployment. In contrast, the positive effect of male unemployment on rape rates remains robust, albeit smaller (a one-percentage-point increase in male unemployment rises the rape rate by 5.3% relative to the sample mean). Finally, in Columns (8) an additional robustness test for omitted variable bias is conducted using the bounding approach proposed by Oster (2019). As mentioned, there might be omitted variables correlated with male unemployment and sexual violence that could introduce bias into the results, such as alcohol consumption, general violence, incarceration rates, average income, and migration rates. While some of these variables may be absorbed by the

¹⁵ The inclusion of only female unemployment as independent variable does not yield any significant result. However, this analysis is likely to be biased since the experience and risk of sexual violence may affect women's labor market outcomes (Borker, 2021; Chakraborty et al., 2018; Loya, 2015; Sabia et al., 2013; Siddique, 2022). Results upon request.

¹⁶ Figure A.4 in the Appendix shows the estimated effects of male unemployment on sexual harassment and rape excluding one state at a time. The graphs demonstrate that the significant positive impacts on both outcomes are not driven by any specific state.

¹⁷ The National Labor Survey (ENOE) round of the IV trimester of 2014 is used to construct the lagged male unemployment rate and not lose observations.

fixed effects and the state-specific linear trends, the test proposed by Oster (2019) is crucial to gain confidence in the robustness of the findings. This approach, founded on the assumption that the selection on observable controls is proportional to the selection on unobservables, establishes bounds for the treatment effect. It considers changes in coefficients and R-squared values between regressions with and without controls and necessitates making hypotheses about the degree of selection proportionality and the maximum R-squared that would result if all unobservables were included. If the bounds exclude 0, the estimated effects are deemed robust to omitted variable bias. Columns (8) in Tables 3 and 4 present the estimated bounds employing the most restrictive specification: proportional selection of observable and unobservables is set at either -1 or 1, and the maximum R-squared is set at 1. The test indicates that the estimated effects for both sexual harassment and rape remain robust in the face of potential omitted variables.

Moreover, Tables A.4 and A.5 in the Appendix indicate that the findings are not due to the variables' functional forms nor to the chosen estimator. In particular, Table A.4 presents the results of the analysis where the sexual crime rates are transformed as either natural logarithms or inverse hyperbolic sines, and male unemployment is either unchanged or transformed according to the outcome variables. These transformations could improve the linearity of the relationship and the normality of the variables' distribution. Across all specifications, the positive significant effects on sexual harassment and rape are confirmed. In particular, the elasticities in Columns (2) and (4) indicate that, for a 1% increase in male unemployment, sexual harassment rises by 0.27% and rape by 0.23%¹⁸. The semi-elasticities and elasticities for the sexual assault outcome are lower than those observed by Saridakis & Spengler (2009) in Greece, but higher than the estimates in Raphael & Winter-Ebmer (2001) for the USA and in Caruso (2015) for Europe. Finally, Appendix Table A.5 shows the incidence rate ratios estimated through Negative Binomial regressions, following Caruso (2015). The dependent variables are the counts (Columns 1 and 3) and rates (Columns 2 and 4) of sexual harassment and rape. Considering the raw number of preliminary inquiries and investigation files may be relevant since the information on the state's population used to construct the rates is annual rather than trimestral. These additional checks confirm that the estimated results hold if changing the estimator and using alternative forms of the dependent variables.

In summary, the battery of tests conducted above consistently demonstrates the robustness of the positive impact of male unemployment on rape rates. Conversely, the impact on sexual harassment,

¹⁸ Recently, there has been a debate on when and how the inverse hyperbolic transformations' results can be interpreted as elasticities. See Bellemare & Wichman (2020) for a detailed discussion. Applying the corrections suggested by the authors does not change the finding for rape, with an estimated elasticity of 0.24, while it increases the elasticity of sexual harassment to 0.73.

although affirmed by the vast majority of tests, may be subject to influence from other state-specific changes over time. However, a final robustness check is required to address the potential measurement error in the outcome variables and investigate whether the observed effect is influenced by changes in reporting rates to authorities rather than in the actual prevalence of sexual violence. As explained, the National Public Security System records data on the initiation of preliminary inquiries and the opening of investigation files. However, the proportion of victims who report sexual crimes to the authorities is very low¹⁹, and this reporting rate may be influenced by the independent variable. To address these concerns, the analysis is conducted using data from the National Victimization Survey (*Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública - ENVIPE*). This annual cross-sectional survey is representative at the national and state levels and gathers information on socio-demographic characteristics and crime incidence affecting households and individuals aged 18 and older. Notably, the ENVIPE inquires whether the person interviewed was forced, through physical violence or threat, by someone known or unknown, to engage in an unwanted sexual activity during the previous year, how many times, and in which month(s) and state(s) it occurred²⁰. This information is utilized to construct the female rape rate per 100,000 female inhabitants aged 18 and older by state and trimester for the years 2015-2018²¹. Table 6, Column (1), presents the effect of male unemployment on the rape rate using the ENVIPE data. While the result is positive, it is not statistically different from zero. However, it becomes pertinent to consider the effect on the rape rate for different age groups, recognizing that victims of sexual violence are typically young and that the ENVIPE suffers from an important limitation by not interviewing people younger than 18 years old²². The analysis reveals that male unemployment does not significantly affect the rate of sexual assaults against women aged 18-24 and 35+, but it substantially increases rapes against women aged 25-34.

¹⁹ As mentioned in the Context section, the percentage of victims who have reported rape to public authorities is around 30%, and it drops to around 10% for other types of sexual violence (ENVIPE, 2016-2020). Indeed, the mean female rape rate per state and trimester according to the National Victimization Survey is 41.25, way higher than that of the National Public Security System.

²⁰ The ENVIPE also asks whether the person was subjected against his/her will to harassment, groping, exhibitionism, or attempted rape. Given that there is not a clear correspondence between this categorization and the National Public Security System one, the robustness check is conducted only for the rape rate. However, male unemployment does not affect these questions when considered as one outcome (results upon request).

²¹ Since the questions refer to victimization during the previous year, the information on the 2019 year was collected in 2020. However, this round is excluded since in 2020 the COVID-19 pandemic spread around Mexico, affecting, among other things, the possibility and way of conducting surveys. Another concern regarding the survey may be the possible misreporting of the months and/or state of occurrence of sexual assaults. However, given the dramatic and traumatizing nature of the crime, it is assumed that the victims can correctly remember when and where it occurred. Finally, note that the results hold if the rate is constructed per 100,000 inhabitants, 100,000 females over 18 years old, and 100,000 females of the same age group.

²² According to the National Survey on Household Dynamics (*Encuesta Nacional sobre la Dinámica de las Relaciones en los Hogares - ENDIREH*), around 1.8% of women aged 15 to 17 years old suffered from some form of sexual violence in the family setting during 2015, 12.8% in the school, and 32.8% in the community. Moreover, 9.4% of the women aged 15 years old or more reported having suffered from sexual violence during childhood, a percentage that increased to 12.6% in 2021 (ENDIREH, 2016-2021).

The impact is considerable (71.6% relative to the mean) and statistically significant at the 5% level, as indicated by the wild-cluster bootstrapped p-value (see Column 3 of Table 6).

Table 6. Robustness checks: ENVIPE analysis

	(1)	(2)	(3)	(4)	(5)	(6)
	Rape - F	Rape - F 18-24	Rape - F 25-34	Rape - F 35-44	Rape - F 45-59	Rape - F 60+
Male	7.876	-1.012	10.758**	-1.996	0.239	-0.114
Unemployment	(7.238)	(4.791)	(5.846)	(2.142)	(2.480)	(0.188)
Observations	512	512	512	512	512	512
Mean	41.254	13.848	15.030	7.677	4.200	0.498
Adj. R-sq	0.041	0.019	0.047	0.027	0.010	0.000
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table presents the impact of male unemployment on the rates of rape of women aged 18 years old or more. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2018. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). The outcome variable is the number of rapes of females (in total or by age group) per 100,000 females 18 years old or older, utilizing information from the National Victimization Survey (ENVIPE). Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Furthermore, the ENVIPE queries victims about whether they reported the crime to the Public Ministry or any other institution. Consequently, the rape reporting rate is constructed as the number of reported crimes over the number of rapes suffered by women, per 100, by state and trimester, and its relationship with male unemployment is investigated. However, it is crucial to acknowledge that this analysis can be no more than exploratory due to sample selection bias. As a matter of fact, the question about reporting is posed only to women who have experienced sexual assaults, and their number and characteristics may have been influenced by the independent variable. The analysis reveals a potential negative relationship, if any, between male unemployment and the reporting rate of rapes (see Appendix Table A.6). The sign may be explained by an increased fear of reporting when male unemployment rises, possibly due to the spread of men in public spaces, and/or by a reduction in trust in authorities associated with unemployment surges. Despite its exploratory nature, this result may shed light on part of the difference in magnitude observed between the effects using data from the National Public Security System and the National Victimization Survey. In conclusion, the analysis utilizing ENVIPE data suggests that the primary results are not – exclusively - driven by measurement errors or changes in reporting rates to authorities, and it indicates that male unemployment increases contribute to rises in sexual assaults particularly against women aged 25-34 (and possibly younger than 18).

7. Mechanisms

The analysis outlined above underscores the robustness of the positive effect of male unemployment on rape rates, while the impact on sexual harassment may be shaped by other state-specific dynamics. As detailed in the Literature Review section, male unemployment may decrease sexual violence through the *opportunity* or *gender equality* channels, or conversely, increase it through the *motivational*, *exposure*, *stress*, and/or *backlash* channels. Consequently, this section delves into the exploration of the relevance of the latter four channels in explaining the observed positive impact.

The first potential channel is the *motivational* one, proposing that the surge in sexual assaults may stem from the diminished likelihood of unemployed males initiating or sustaining relationships. This mechanism is grounded in evolutionary theories, suggesting that rape may represent an adaptation of a strategy evolved to enhance men's reproductive success (Thornhill & Palmer, 2000). Consequently, if male unemployment decreases men's probability of being in a relationship, there might be an increase in sexual assaults (McKibbin et al., 2008). Although this theory has faced criticism from other strands of the literature, I assess its relevance in the current context by examining whether male unemployment impacted divorce and marriage rates. Specifically, Appendix Table A.7 relates male unemployment rates with the number of divorces and marriages per 1,000 inhabitants, extracted from the National Institute of Statistics and Geography (INEGI) administrative records, including state, year, and quarter fixed effects. The analysis reveals no significant effects, affirming that the rise in sexual violence is not attributed to shifts in relationship dynamics.

Secondly, the *exposure* channel suggests that the diminished mobility of unemployed individuals may lead to an increase in sexual crimes if the perpetrators are family members or close friends. Conversely, if the offenders are typically strangers and/or usually happen in public spaces, the presumed direction of the effect is the opposite, and the channel is termed *opportunity*. Given the observed positive impact, the potentially relevant channel in this context is the *exposure* one. Unfortunately, there is a lack of direct data to test this hypothesis. However, the suggestive evidence that male unemployment increased also sexual harassment, beyond rape, may indicate that this channel is not determinant. Indeed, it was assumed that the direction of the effect of this mechanism was the opposite for sexual harassment and rape, considering that the perpetrator is typically a stranger for the former crime while he is a family member or friend for the latter. Therefore, the reduced mobility and social interactions resulting from male unemployment should mostly decrease women's exposure to potential aggressors in the case of sexual harassment and increase it in the case of rape. However, given that the relationship between male unemployment and both sexual

harassment and rape points in a positive direction, the potential relevance of the *exposure* channel appears undermined.

The third theory that could potentially explain why male unemployment increases sexual assaults is the *stress* hypothesis. Unemployment may elevate stress levels, leading to diminished emotional and impulse control, as well as increased substance abuse, thereby raising the likelihood of violent behavior. Therefore, Appendix Table A.8 explores whether male unemployment influences rates of male suicides and deaths related to mental and behavioral disorders, derived from the mortality records of the National Institute of Statistics and Geography (INEGI)²³. The findings of the analysis do not support the hypothesis associated with the *stress* channel, as male unemployment does not significantly impact the mentioned extreme outcomes indicative of heightened stress.

Finally, the *backlash* channel posits that male unemployment may escalate sexual violence in response to the perceived threat against traditional masculine identity caused by reduced job opportunities. This theory suggests that the observed positive effect might be especially or exclusively evident in communities where males hold more conservative views on gender roles. However, due to the absence of data on men's attitudes, the *backlash* hypothesis is examined inversely: male unemployment may particularly elevate sexual violence in states where women have more progressive views on gender roles. In such communities, the perceived risk to men's sense of identity may be higher, with reduced job opportunities seen as a more significant threat to "masculinity", potentially intensifying frustration and triggering backlash against more progressive women in the form of sexual violence²⁴. To test this hypothesis, a heterogeneous analysis is conducted based on women's gender attitudes, using data from the National Survey on Household Dynamics (*Encuesta Nacional sobre la Dinámica de las Relaciones en los Hogares* – ENDIREH). As both unemployment and sexual violence may influence gender attitudes, the data are retrieved from the first survey round before the current analysis's time frame (2015-2019), specifically the 2011 ENDIREH round. The analysis considers women's responses to ten questions about masculine and feminine roles, constructing an indicator of the states' female baseline progressivity (see the Appendix for the text of the ten questions). The variable equals 1 if the average number of women's agreements to the questions in the state exceeds the median for the whole of Mexico. Table 7 presents the results of fully-interacted models to account for progressive-specific effects over time.

²³ The analysis is conducted on the total number of deaths from mental and behavioral disorders. However, investigating the specific causes of death from mental and behavioral disorders does not give significant findings (results upon request).

²⁴ Note that this would not be the case in communities and societies where *both* men and women have progressive attitudes overcoming traditional gender roles.

Table 7. Mechanisms: Heterogeneity analysis on the state’s female progressivity

	(1) Harassment	(2) Abuse	(3) Rape
Male Unemployment	0.028 (0.026)	-0.264** (0.109)	0.009 (0.096)
Male Unemployment *Female Progressive	0.206*** (0.054)	0.466** (0.203)	0.436** (0.153)
Observations	632	632	632
Mean	0.392	3.406	3.250
Adj. R-sq	0.604	0.820	0.737
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes
Female Progr.-Year FE	Yes	Yes	Yes
Female Progr.-Trim FE	Yes	Yes	Yes

Notes: The Table presents the heterogeneity analysis of the impact of male unemployment on the rates of sexual harassment, sexual abuse, and rape, with respect to the gender-equal opinions of women in the state. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Sexual violence rates represent the number of crimes per 100,000 inhabitants, utilizing information from the National Public Security System (NPSS). “Female Progressive” is an indicator equal to 1 if the average number of questions about gender roles that women in the state agree to is higher than the median number for Mexico, according to the 2011 National Survey on Household Dynamics (ENDIREH). The analysis includes state, trimester, year, trimester*female progressive, and year*female progressive fixed effects, covering the period from 2015 to 2019. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

The effect of male unemployment in states where women held more conservative views on gender roles is positive, but small and not statistically different from 0, for sexual harassment and rape, while it is negative and significant at the 5% level for sexual abuse. Conversely, the coefficients of the interaction between the male unemployment rate and the indicator for baseline female progressivity are positive and significant for all kinds of sexual violence. Moreover, the magnitudes are larger than the main results. Therefore, the heterogeneity analysis provides suggestive evidence that male unemployment increases sexual violence through the *backlash* channel since the effect is observed only in states where women held more progressive attitudes at baseline. Furthermore, Appendix Table A.9 confirms that the finding is not driven by different reporting rates to the authorities between more and less progressive women. Indeed, Table A.9 presents the results of the heterogeneity analysis using data from the National Victimization Survey (ENVIPE), indicating that the interaction term is positive and significant for women aged 24-35.

8. Conclusion

This analysis underscores that male unemployment contributes to heightened rates of sexual harassment and rape in Mexico. Utilizing Ordinary Least Squares regressions with state, year, and quarter fixed effects, the study establishes a connection between male unemployment rates, sourced from the National Labor Survey, and sexual crime rates reported by the National Public Security System for the years 2015-2019. Rigorous checks ensure the robustness of the results, particularly for sexual assault, addressing concerns related to omitted variables, simultaneity, variables' functional forms, and changes in reporting rates to authorities. Furthermore, suggestive evidence indicates that the identified outcomes are not a product of shifts in relationship dynamics or heightened stress levels. Instead, they point to a backlash against the perceived threat to traditional masculine identity posed by diminishing job opportunities, specifically observed in states where women exhibited more progressive attitudes.

Prior research in the United States and Europe has sporadically identified a positive link between male unemployment and sexual violence. However, such findings often lacked robustness and were not the primary focus of the investigations. This study brings a novel interdisciplinary perspective to unravel the intricate relationship between male unemployment and sexual violence, uniquely exploring this dynamic within a Latin American country, whose sociocultural context may differ from the US and European ones. Furthermore, the empirical findings are rigorously tested and thoroughly discussed, contributing to a more comprehensive understanding of the underlying mechanisms.

While the analysis includes robustness checks to address potential threats to causal interpretation, certain limitations persist. One concern is the possibility of selective migration, where more aggressive men may move from high to low-unemployment states, potentially introducing a downward bias (Tur-Prats, 2021). Future investigations could benefit from leveraging natural experiments to establish exogenous changes in male unemployment, providing clearer causal interpretations. Additionally, limitations stem from data constraints. The National Public Security System (NPSS) data lack sociodemographic information and suffer from the low reporting rate of sexual crimes. Although the National Victimization Survey (ENVIPE) helps address these issues, it has other shortcomings, such as excluding individuals under 18 from interviews and challenges in comparing the considered sexual crimes with the NPSS's categories. Finally, data constraints hinder a detailed exploration of mechanisms, particularly concerning the *exposure* channel.

However, in light of the findings, potential policy interventions are suggested to mitigate the observed positive impact of male unemployment on sexual violence. While the introduction of unemployment

benefits and the tightening of sexual crimes' penalties may offer short-term relief, a more sustainable solution entails forward-looking policies at the community and societal levels addressing sociocultural gender roles. Indeed, by severing the link between masculine identity, the male breadwinner norm, and aggressive behaviors, these policies can reduce backlash reactions and foster a more equal societal environment in the long term.

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Appendix

Definitions

Employment variables (ENOE - Encuesta Nacional de Ocupación y Empleo)

Employed: A person of 15 years or more is considered employed if:

- Has worked at least one hour the previous week;
- Has spent at least one hour the previous week engaging in an activity that provided income or assisting with the land or business of a family member or another person;
- Did not work last week because of strike or labor stoppage, technical stoppage, temporary suspension of work (salaried), attendance at training courses, or other reasons (vacations; permission, illness, or personal matters; lack of a vehicle or machinery breakdown; lack of raw materials, financing, or clients; bad weather or natural phenomenon; end of work or harvest season) receiving salary or earnings;
- Did not work for one of the previous reasons (vacations; permission, illness, or personal matters; lack of a vehicle or machinery breakdown; lack of raw materials, financing, or clients; bad weather or natural phenomenon; end of work or harvest season) without receiving salary or earnings, but will return to the same job this week.

Unemployed: A person of 15 years or more is considered unemployed if:

- Did not work the previous week because will start a new job or business;
- During the previous month, has looked for a job in another country or made preparations to cross the border, has looked for a job in Mexico, or has started a business or engaged in an activity on their own without being able to start yet, and was available to work the previous week;
- Did not work for one of the various reasons (vacations; permission, illness, or personal matters; lack of a vehicle or machinery breakdown; lack of raw materials, financing, or clients; bad weather or natural phenomenon; end of work or harvest season) without receiving salary or earnings and without returning to the same job this week, looking for a job (looked for a job in another country or made preparations to cross the border, looked for a job in Mexico, or started a business or engaged in an activity on their own without being able to start yet) during the previous month and available to work the previous week.

Economically active population: Employed population + Unemployed population.

Sexual crime variables (NPSS - Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública)

Sexual Harassment: Behavior committed against a person, regardless of their gender, in which, without a subordinate relationship, verbal, physical, or both types of actions related to sexuality are carried out, putting them at risk or leaving them in a state of vulnerability and at risk of causing them damage or psycho-emotional suffering that harms their dignity, regardless of whether one or multiple events of the described nature occur.

Sexual Harassment in a Hierarchical Relationship: Behavior in which the responsible party, leveraging a hierarchical position derived from work, educational, domestic, or any other relationship that creates subordination, harasses another person by making propositions, using explicit language for this purpose, or requesting the performance of any sexual act.

Sexual Abuse: To perform a sexual act on a person without their consent and without the intent to engage in sexual intercourse, or to compel them to observe it or to have them perform it.

Rape: includes “Simple Rape” and “Aggravated or Equated Rape”. “Simple Rape” is defined as engaging in sexual intercourse with a person of any gender without their consent through physical or moral violence. “Aggravated or Equated Rape” is defined as: engaging in sexual intercourse with a person who lacks the capacity to understand the significance of the act or who, for any reason, cannot resist it; or the introduction by anal or vaginal means of any object, instrument, or part of the human body other than the penis into a person who lacks the capacity to understand the significance of the act or who, for any reason, cannot resist it.

Domestic Violence: To exercise, through action or omission, any type of physical, psychosocial, sexual, or economic violence, inside or outside the family home, against a spouse, cohabiting partner, consanguineous relative in the direct ascending or descending line without limit of degree, or collateral consanguineous or affinity relative up to the fourth degree, the adopter or adopted, or against the incapacitated person for whom one is a guardian or curator.

Femicide: A criminal act committed by a person when they take the life of a woman on the grounds of gender, understanding that there are gender-related reasons when one or more of the following circumstances are present in the woman's life deprivation:

- There exists or has existed a relationship of consanguinity or affinity, marriage, cohabitation, courtship, or any other relationship involving trust, subordination, or superiority between the aggressor and the victim.

- There exists or has existed a sentimental, employment, educational, or any other relationship involving trust, subordination, or superiority between the aggressor and the victim.
- The victim displays signs of any type of sexual violence.
- Infamous, degrading, or mutilation injuries have been inflicted on the victim prior to the deprivation of life, or the corpse displays infamous or degrading marks, necrophilia, or has been mutilated.
- Threats, harassment, or injuries by the aggressor against the victim, or misogyny, have existed.
- The victim's body is exposed or discarded in a public place.
- The victim has been placed incommunicado.
- The victim is pregnant.
- Any other circumstances not described but considered in federal and state penal legislations.

Mechanism variables

Mortality from mental and behavioral disorders: Deaths because of dementia; Alcohol Dependence Syndrome; other mental and behavioral disorders due to alcohol use; mental and behavioral disorders due to other psychoactive substance use; schizophrenia, schizotypal disorders, and delusional disorders; mood disorders; neurotic syndromes, stress-related disorders, and somatoform disorders; behavioral syndromes associated with physiologic disturbances and physical factors; mental retardation (INEGI mortality records).

Female Progressivity: States where the average of women aged 15 or older who agreed to the following questions is higher than the Mexican median of 8.26:

- Should a wife NOT obey her husband or partner in everything he orders?
- Should a woman have the right to choose her friends?
- Should a man NOT be responsible for all the expenses of the family?
- Does a woman have the same capacity as a man to earn money?
- Is it NOT a woman's obligation to have sexual relations with her husband or partner?
- Is a woman free to decide if she wants to work?
- Does a man NOT have the right to beat his wife?
- Should the care of the children be shared between the couple?
- Do the parents NOT have the right to beat their children?
- If there is hitting or abuse in the home, is it NOT a family matter and should NOT it remain there? (ENDIREH - *Encuesta Nacional sobre la Dinámica de las Relaciones en los Hogares*)

Additional Tables and Figures

Table A.1. Variables' Construction

Variable	Construction
<i>Unemployment Variables</i>	
Male Unemployment	Number of male unemployed over number of economically active males, by state and trimester, per 100
Female Unemployment	Number of female unemployed over number of economically active females, by state and trimester, per 100
Lagged Male Unemployment	Number of male unemployed over number of economically active males, by state and in the previous trimester, per 100
<i>Sexual Violence Variables</i>	
Harassment	Number of preliminary inquiries and investigation files on sexual harassment, by state and trimester, over the state's population of that year, per 100,000
Abuse	Number of preliminary inquiries and investigation files on sexual abuse, by state and trimester, over the state's population of that year, per 100,000
Rape	Number of preliminary inquiries and investigation files on rape, by state and trimester, over the state's population of that year, per 100,000
Harassment (hierarchy)	Number of preliminary inquiries and investigation files on sexual harassment in hierarchical relationships, by state and trimester, over the state's population of that year, per 100,000
Domestic Violence	Number of preliminary inquiries and investigation files on domestic violence, by state and trimester, over the state's population of that year, per 100,000
Femicide	Number of preliminary inquiries and investigation files on femicide, by state and trimester, over the state's population of that year, per 100,000
<i>Transformations</i>	
LN Variable	Natural logarithm of the Variable plus 1
IHS Variable	Inverse hyperbolic sine of the Variable
Variable Count	Number of preliminary inquiries and investigation files on that kind of sexual violence, by state and trimester

ENVIPE Variables

Rape - F	Number of females older than 18 who reported having suffered rape, by state and trimester, over the number of the state's females older than 18 in that year, per 100,000
Rape - F - Age Group	Number of females of that Age Group who reported to have suffered rape, by state and trimester, over the number of the state's females older than 18 in that year, per 100,000
Rape Report Rate - Pub Min / Tot	Number of rapes reported to the Public Ministry or to any authority, by state and trimester, over the number of rapes of females, per 100

Mechanisms

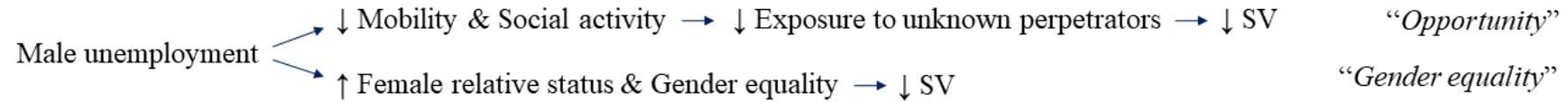
Divorce - Demand/Register	Number of divorce demands or registrations, by state and trimester, over the state's population of that year, per 100,000
Marriage	Number of marriage registrations, by state and trimester, over the state's population of that year, per 100,000
Suicide - Occurrence/Register	Number of male suicides, by trimester and state of occurrence or registration, over the state's population of that year, per 100,000
Mortality Mental Disorder - Occurrence/Register	Number of male deaths because of mental and behavioral disorders, by trimester and state of occurrence or registration, over the state's population of that year, per 100,000
Female Progressive	Equal to 1 if the average number of questions about gender roles that women in the state agree to is higher than the median number for Mexico of 8.26

Notes: own elaboration.

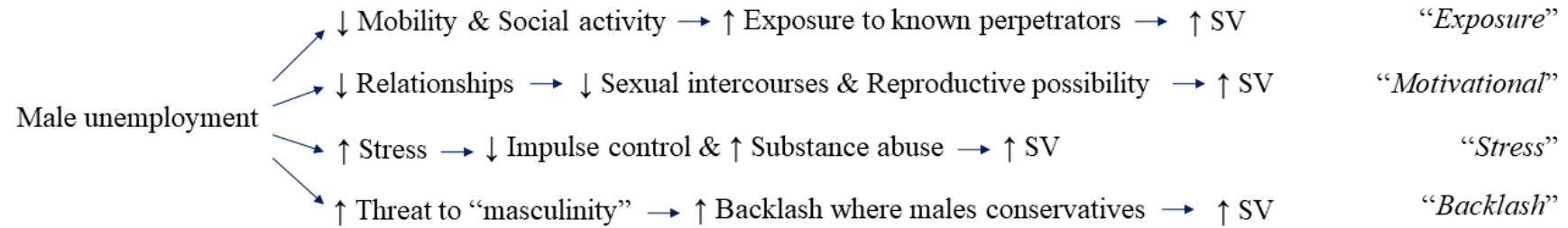
Figure A.1. Scheme of the conceptual framework

Relationship between Male Unemployment and Sexual Violence

Negative effect



Positive effect



By type of Sexual Violence

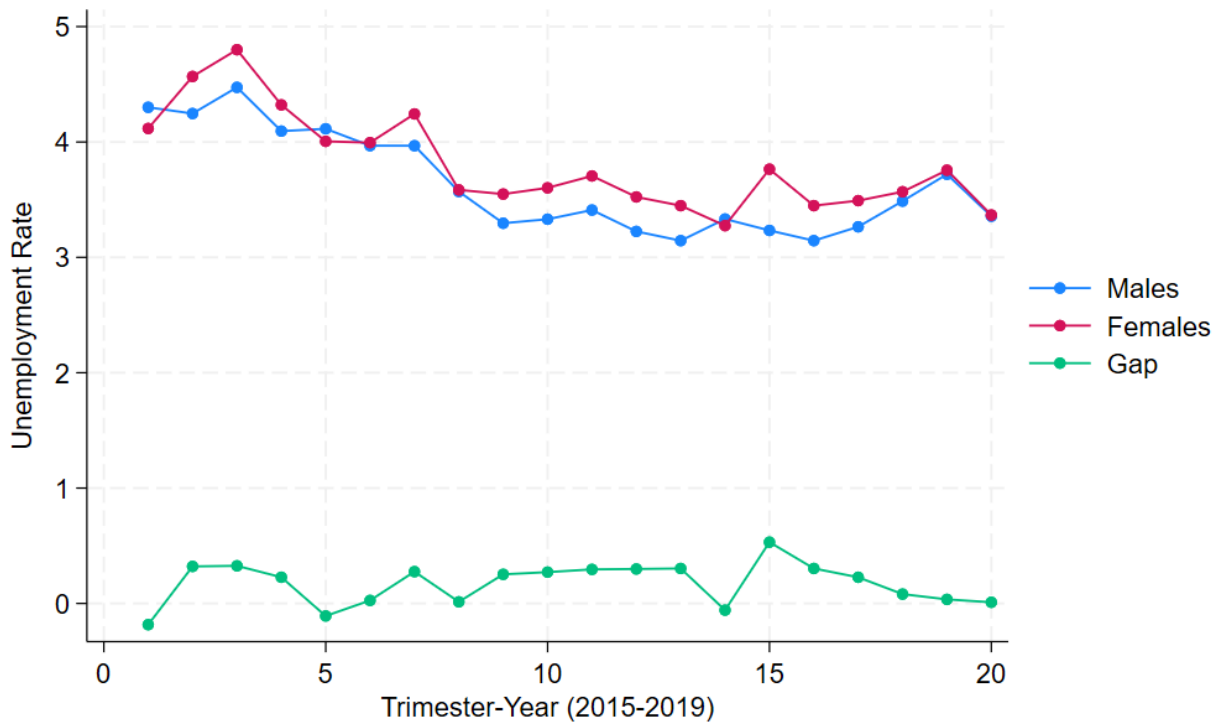
Male unemployment → Sexual harassment: ↓ (*opportunity* or *gender equality*), ↑ (*backlash* or *stress*)

Male unemployment → Sexual abuse: ↓ (*opportunity* or *gender equality*), ↑ (*exposure*, *backlash*, or *stress*)

Male unemployment → Rape: ↓ (*gender equality*), ↑ (*motivational*, *exposure*, *backlash*, or *stress*)

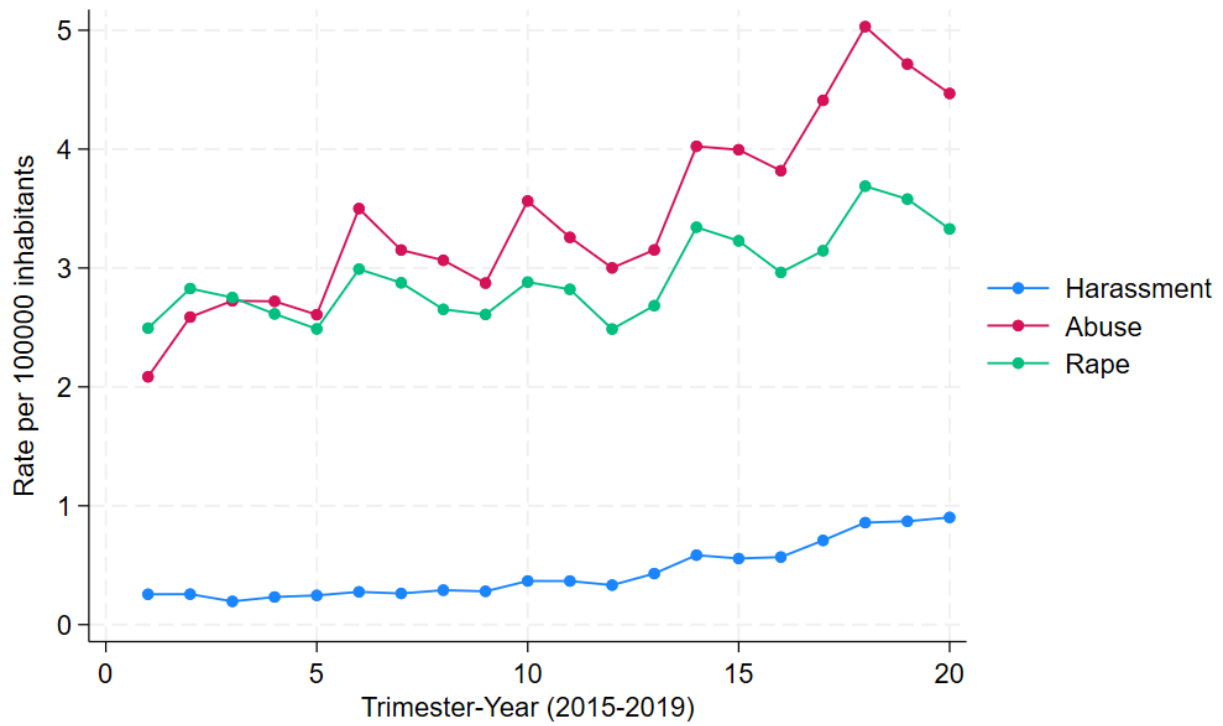
Notes: own elaboration based on the Theoretical Literature of Section 2.1.

Figure A.2. Evolution of unemployment rates by sex



Notes: The Figure shows the evolution over time of male and female unemployment rates, for the period 2015-2019, using population weights. *Source:* National Labor Survey (ENOE).

Figure A.3. Evolution of sexual violence rates



Notes: The Figure shows the evolution over time of sexual violence rates, for the period 2015-2019, using population weights. Sexual violence rates represent the number of crimes per 100,000 inhabitants. *Source:* National Public Security System (NPSS).

Table A.2. Effect of male unemployment on additional outcomes

	(1) Harassment (hierarchy)	(2) Domestic Violence	(3) Femicide
Male Unemployment	-0.022 (0.018)	0.755 (1.032)	0.009 (0.015)
Observations	632	632	632
Mean	0.288	37.127	0.141
Adj. R-sq	0.679	0.834	0.407
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes

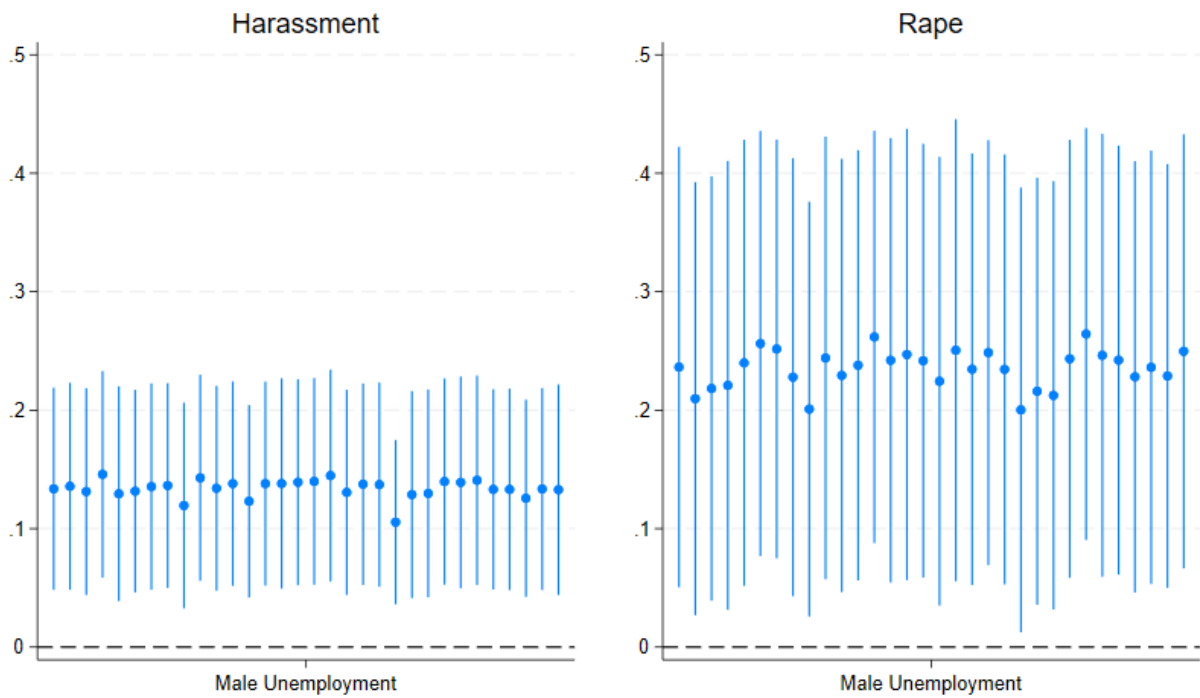
Notes: The Table presents the impact of male unemployment on the rates of sexual harassment in hierarchical relationships, domestic violence, and femicide. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Sexual violence rates represent the number of crimes per 100,000 inhabitants, utilizing information from the National Public Security System (NPSS). Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Table A.3. Robustness checks: Sexual Abuse

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male Unemployment	0.021 (0.108)	0.076 (0.181)	0.026 (0.107)	-0.056 (0.080)		0.042 (0.091)	-0.023 (0.094)	[-0.059, 4.399]
Female Unemployment			-0.018 (0.113)					
Lagged Male Unemployment					-0.067 (0.136)	-0.078 (0.125)		
Observations	632	632	632	612	632	632	632	632
Mean	3.406	3.406	3.406	3.303	3.406	3.406	3.406	3.406
Adj. R-sq	0.816	0.839	0.816	0.827	0.817	0.816	0.930	0.816
Pop. Weights	No	Yes	No	No	No	No	No	No
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Trim FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year FE	No	No	No	No	No	No	Yes	No
CDMX	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Notes: The Table presents the robustness checks for the effect of male unemployment on sexual abuse. The outcome variable is the number of sexual abuse investigation files per 100,000 inhabitants, per state and trimester, for the years 2015-2019, utilizing information from the National Public Security System (NPSS). Male and female unemployment rates are the state's same-quarter number of unemployed over the economically active population of the same sex per 100, while the lagged male unemployment refers to the previous quarter, constructed using data from the National Labor Survey (ENOE). "Pop. Weights" refers to the use of the state's annual population as weight in the analysis. "State FE", "Year FE", "Trim FE", and "State-Year FE" refer to the inclusion of state, year, trimester, and state*year fixed effects, respectively. "CDMX" stands for Mexico City. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Figure A.4. Robustness check: Excluding 1 state at a time



Notes: The Figure shows the estimated coefficients of the effect of male unemployment on sexual harassment and rape excluding one state at a time. The specification includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Sexual violence rates represent the number of crimes per 100,000 inhabitants, utilizing information from the National Public Security System (NPSS). Standard errors are clustered by state.

Table A.4. Robustness checks: Variables' functional form

	(1) LN Harassment	(2) LN Harassment	(3) LN Rape	(4) LN Rape	(5) IHS Harassment	(6) IHS Harassment	(7) IHS Rape	(8) IHS Rape
Male Unemployment	0.059*** (0.016)		0.047** (0.021)		0.076*** (0.021)		0.059** (0.027)	
LN Male Unemployment		0.269*** (0.089)		0.235** (0.103)				
IHS Male Unemployment						0.277*** (0.094)		0.237** (0.110)
Observations	632	632	632	632	632	632	632	632
Mean	0.269	0.269	1.355	1.355	0.333	0.333	1.758	1.758
Adj. R-sq	0.694	0.694	0.728	0.729	0.681	0.681	0.723	0.724
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows the effect of male unemployment on sexual harassment and rape rates, where the outcome is transformed as either the natural logarithm (plus 1) or the inverse hyperbolic sine, while the independent variable is either unchanged or transformed as the outcome variable. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Sexual violence rates represent the number of crimes per 100,000 inhabitants, utilizing information from the National Public Security System (NPSS). Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Table A.5. Robustness checks: Alternative estimators and outcomes

	(1) Harassment Count	(2) Harassment Rate	(3) Rape Count	(4) Rape Rate
Male Unemployment	0.262 ^{***} (0.099)	0.192 ^{***} (0.067)	0.056 ^{**} (0.026)	0.070 ^{***} (0.022)
Observations	632	632	632	632
Mean	17.256	0.392	112.973	3.250
Log-Likelihood	-1638.835	-321.475	-2936.145	-999.177
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes	Yes

Notes: The Table presents the incidence rate ratios of male unemployment on the number and rate of sexual harassment and rape estimated through Negative Binomial regressions. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). The outcomes are defined as the number of preliminary inquiries and/or openings of the investigation file for each sexual crime in Columns (1) and (3), or as the number per 100,000 inhabitants in Columns (3) and (4), utilizing information from the National Public Security System (NPSS). Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6. Robustness checks: Rape reporting rate (ENVIPE)

	(1) Rape Report Rate - Pub Min	(2) Rape Report Rate - Tot
Male Unemployment	-14.902 ^{***} (5.855)	-19.982 ^{***} (6.708)
Observations	208	208
Mean	23.934	29.249
Adj. R-sq	0.141	0.176
State FE	Yes	Yes
Year FE	Yes	Yes
Trim FE	Yes	Yes

Notes: The Table presents the relationship between male unemployment and the reporting rate of rapes of females aged 18 years old or more. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2018. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). The reporting rate is the number of rapes reported to the Public Ministry (Column 1) or to any authority (Column 2) over the number of rapes of females, per 100, utilizing information from the National Victimization Survey (ENVIPE). The low number of observations is due to the high number of state-trimester groups without any sexual assault. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Table A.7. Mechanisms: Effect on Divorce and Marriage Rates

	(1) Divorce - Demand	(2) Divorce - Register	(3) Marriage
Male Unemployment	0.004 (0.006)	0.010 (0.007)	0.017 (0.024)
Observations	632	632	632
Mean	0.302	0.320	1.106
Adj. R-sq	0.883	0.868	0.574
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes

Notes: The Table presents the impact of male unemployment on the rates of divorce and marriage. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Nuptiality rates represent the number of divorce demands (Column 1) or registrations (Column 2) and of marriage registrations (Column 3) per 1,000 inhabitants, utilizing information from the INEGI nuptiality records. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Table A.8. Mechanisms: Effect on Male Suicide and Mortality from Mental Disorder Rates

	(1) Suicide - Occurrence	(2) Suicide - Register	(3) Mortality mental disorder - Occurrence	(4) Mortality mental disorder - Register
Male Unemployment	0.004 (0.041)	0.013 (0.038)	-0.016 (0.019)	-0.001 (0.019)
Observations	632	632	628	632
Mean	1.247	1.271	0.683	0.683
Adj. R-sq	0.737	0.756	0.604	0.617
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes	Yes

Notes: The Table presents the impact of male unemployment on the rates of male suicide and mortality from mental and behavioral disorders. The analysis includes state, year, and trimester fixed effects, covering the period from 2015 to 2019. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). Suicide and mortality rates represent the number of male dead because of these reasons, by trimester and state of occurrence (Columns 1 and 3) or register (Columns 3 and 4), per 100,000 inhabitants, utilizing information from the INEGI mortality records. Mortality from mental and behavioral disorders include deaths because of dementia; Alcohol Dependence Syndrome; other mental and behavioral disorders due to alcohol use; mental and behavioral disorders due to other psychoactive substance use; schizophrenia, schizotypal disorders, and delusional disorders; mood disorders; neurotic syndromes, stress-related disorders, and somatoform disorders; behavioral syndromes associated with physiologic disturbances and physical factors; mental retardation. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

Table A.9. Mechanisms: Heterogeneity analysis on state's female progressivity (ENVIPE)

	(1)	(2)	(3)	(4)	(5)	(6)
	Rape - F	Rape - F	Rape - F	Rape - F	Rape - F	Rape - F
		18-24	25-34	35-44	45-59	60+
Male Unemployment	0.582 (9.267)	0.442 (7.286)	1.164 (3.749)	-0.981 (3.058)	0.262 (4.441)	-0.305 (0.321)
Male Unemployment *Female Progressive	11.844 (16.803)	-5.915 (11.356)	20.869* (12.942)	-3.543 (4.203)	0.071 (4.773)	0.361 (0.335)
Observations	512	512	512	512	512	512
Mean	41.254	13.848	15.030	7.677	4.200	0.498
Adj. R-sq	0.039	0.020	0.064	0.038	0.009	-0.005
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Trim FE	Yes	Yes	Yes	Yes	Yes	Yes
Female Prog.-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Female Prog.-Trim FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table presents the heterogeneity analysis of the impact of male unemployment on rates of rape of women aged 18 years old or more, with respect to the gender-equal opinions of women in the state. Male unemployment is defined as the number of unemployed males over the economically active population, per 100, constructed using data from the National Labor Survey (ENOE). The outcome variable is the number of rapes of females (in total or by age group) per 100,000 females 18 years old or older, utilizing information from the National Victimization Survey (ENVIPE). “Female Progressive” is an indicator equal to 1 if the average number of questions about gender roles that women in the state agree to is higher than the median number for Mexico, according to the 2011 National Survey on Household Dynamics (ENDIREH). The analysis includes state, trimester, year, trimester*female progressive, and year*female progressive fixed effects, covering the period from 2015 to 2019. Standard errors, clustered by state, are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, according to the wild-cluster bootstrap p-value.

