LAW, CRIMINOLOGY & CRIMINAL JUSTICE | RESEARCH ARTICLE

The impact of sexual violence on female labour force participation: The case of Hurungwe and Zvimba Districts, Zimbabwe

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Abstract: Sexual violence is a serious public health and human rights issue with both short- and long-term psychological and physical consequences on women and their decision to work. However, scant scholarly literature examines the relationship between sexual violence and female labour force participation (FLFP). Using evidence from a survey with 301 economically active women in Zvimba and Hurungwe districts, the binomial logit results revealed that education and sexual violence experienced in the past 12 months preceding the survey had a positive influence on FLFP while lifetime experience of sexual violence had a negative impact on FLFP. The results imply that educational attainment increases the chances that one will be participating in the labour market and that women who experienced sexual violence in the past 12 months would go to work as an economic adaptation strategy against poverty and further violation while those with lifetime experiences avoid

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PUBLIC INTEREST STATEMENT

Sexual violence is a serious public health and human rights issue with both short- and long-term psychological and physical consequences on women and their decision to work. Therefore, this study examined the impact of sexual violence on female labour force participation in Zimbabwe. 301 economically active women in Zvimba and Hurungwe districts, participated in the study. The findings showed that lifetime experience of sexual violence had a negative impact on women’s decision to work while education and sexual violence experienced in the past 12 months preceding the survey had a positive influence on their decision to work. Recommendations regarding how to address the problem of sexual violence against women and improve female labour force participation have been provided.
work due to psychological and physical effects of the crime. The study recommends using awareness programs to educate communities about the consequences of sexual violence, available services, and survivors' futures. The government should introduce policies that promote greater access to higher levels of education by women in Zimbabwe.

**Subjects:** Gender Studies; Economic Psychology; Gender & Development; Economics and Development; Labour Economics; Women; s Literature

**Keywords:** Sexual violence; labour force participation; education; health; crime; Zimbabwe

1. **Introduction**

Sexual violence is a serious public health and human rights issue with both short- and long-term consequences on women’s physical, mental, and sexual and reproductive health (Heidari & Moreno, 2016; Jaff, 2020; Krug et al., 2002). Globally, World Health Organization (WHO, 2021) reveals that about 1 in 3 (33%) of women worldwide have experienced either physical and/or sexual intimate partner violence (IPV) or non-partner sexual violence in their lifetime. The problem of sexual violence is widespread in Africa, with an estimate of 36.6% of women having experienced partner physical or sexual violence or non-partner sexual violence (Steele et al., 2019). Data on Zimbabwe show that 11.6% of women aged 15–49 years experienced sexual violence at least once in their lifetime, and 5.1% experienced sexual violence in the past 12 months (Zimbabwe National Statistical Agency [ZIMSTAT, 2019]. According to Krug et al. (2002), Bows (2016), Berlo and Ploem (2018), and Medie (2019), sexual violence is driven by many factors operating in a range of social, cultural and economic contexts. In many societies, particularly in developing countries, women are viewed as subordinate to men and have a lower social status, allowing men control over and greater decision-making power than women (Berlo & Ploem, 2018; Medie, 2019; WHO, 2009). These inequalities emanate mainly from traditional and religious beliefs that give men the right to control women making women and girls susceptible to sexual violence by men. Apart from gender inequalities, Bows (2016) identified the family structure in which men are raised to be another contributor to this problem of sexual violence. Bows (2016) highlighted that men raised in families with strongly patriarchal structures are more likely to become violent, rape and use sexual coercion against women, and abuse their intimate partners than men raised in more egalitarian homes. In response to the detrimental effects of sexual violence, women often adopt the strategy of avoidance by modifying their lifestyle, in which quitting the workforce can be one of the possible strategies (Chakraborty et al., 2017). Sexual violence impinges immense direct and indirect economic costs when women decide not to participate in the labour force and due to loss of potential at work (low productivity), which results in low earnings. There is a realisation that women's economic empowerment boosts productivity, increases economic diversification and income equality, and other positive development outcomes (International Monetary Fund, 2018). Women empowerment leads to economic development through two mechanisms, which are gender diversity and sectoral reallocation. Under the gender diversity argument, women bring new skills to the workplace, which may reflect social norms and their impact on upbringing, social interactions, and differences in risk preferences and response to incentives (Ostry et al.,) While the sectoral reallocation mechanism states that demand for services rises during economic development and makes labour be reallocated to the growing sector, making economies more inclusive (ibid). Low female labour force participation (FLFP) rates can have adverse economic effects, like reducing potential economic growth rates (ILO, 2018). Besides being a fundamental human rights issue, it is becoming widely accepted that gender equality is key to prosperous economies, inclusive and sustainable economic growth. Despite the efforts by the government of Zimbabwe to achieve the Sustainable Development Goals (SDG) number 5 and 8, the 2019 Labour Force and Child Labour Supply Survey results show that more needs to be done to achieve gender equality and sustainable economic growth, as the FLFP rate was 34.4%. Sexual violence against women could impede the government's efforts to achieve gender equality, which engenders significant
economic gains. Studies conducted in India by Chakraborty et al. (2017) and Siddique (2018) showed that sexual violence or crime against women negatively impacts labour force participation. Sabia et al. (2013) found similar results in their study using the USA data. Despite the possible negative impact of sexual violence on FLFP, there is a dearth of scholarly literature on the impact of sexual violence on FLFP in Zimbabwe and particularly in Mashonaland West province. Although Beneo and Pillai (2003), Chikwanha and Ncube (2014), and Mapuranga et al. (2015) undertook studies on factors that affect FLFP and sexual harassment of female employees in Zimbabwe, it should be argued that they are limited in scope as they did not examine the relationship between FLFP and sexual violence. Mashonaland West province is considered among those with high rates of sexual violence, where 11% of women in the province are victims of this crime and have a low FLFP rate of 36% against 54% for their male counterparts (ZIMSTAT, 2020). Therefore, this study aims to investigate the impact of sexual violence on women’s labour force participation. The research questions for this study are as follows:

(i) Does sexual violence against women affect their decision to participate in the labour force?
(ii) What are the other factors that influence women’s decision to participate in the labour force?

2. Literature review

2.1. Theoretical literature review

Mincer (1962), Chaykowski and Powell (1999), Beneo and Pillai (2003), and Sabia et al. (2013), and Hosney (2016), among other researchers, considered factors that influence FLFP and discussed several theories that explain the female’s decision to be an active or inactive participant in the labour market. According to the endogenous growth theory, human capital accumulation is essential in economic growth (Abbas, 2001). Such productivity improvements emanate from faster innovation and more investments in human capital, which improves both the quantity and quality of labour. However, sexual violence can derail countries’ efforts, thereby compromising supply and the quality of labour available in the market. It can have adverse health effects (psychological and physical consequences) that negatively impact one’s productivity.

2.1.1. Work-leisure choice theory

The Work-Leisure Choice theory, also known as the Neo-Classical Microeconomic model, is a work of Mincer (1962) which assumed that households; suppliers of labour in an economy are rational and seek to maximise their utility; deciding on how much time to devote to work and how much time to devote for leisure (Hosney, 2016). This theory posits that women weigh costs and benefits when deciding whether to participate in the labour market. In this regard, there exists a trade-off associated with the opportunity cost of choosing one option over the other, in that the consumption of more leisure and fewer working hours result in less income, and the opposite is true. Therefore, the labour supply decision is dependent on the remuneration accrued to labour, other non-labour income and the utility of the economic unit between work and leisure (Abraham et al., 2017).

Psacharopoulos and Tzannatos (1992) further explained the theory by stating that since the decision depends on the remuneration from work (wage rate), the higher the wage rate, the more attractive work becomes and the less attractive the leisure becomes. Thus, work-leisure choice theory examines the labour market supply behaviour based on the consumption theory where an individual derives utility from the consumption of goods (with constant prices), (C) and leisure (L). The underpinning assumptions of this theory are that; leisure is a normal good (Hosney, 2016); an individual consumes all her income such that the amount spent on commodities is equivalent to total income; and an endowment block of time (T) available is split between hours of work (H) and leisure (Ntuli, 2007). Leisure in this theory is also assumed to incorporate the time spent producing goods and services at home. The formal representation of the neoclassical model is given as;
\[ U = U_c(C, L) \]  \hspace{1cm} (1)

Where; \( U \) is the utility function of the economic agent;

\( C \) is the consumption of market commodities;

\( L \) is leisure.

The utility function will be maximised subject to income and time constraints which are given as follows;

\[ Y = WH + K \ldots \ldots \text{income constraint} \]  \hspace{1cm} (2)

\[ T = H + L \ldots \ldots \text{time constraint} \]  \hspace{1cm} (3)

Where; \( Y \) represents income; \( W \) is the wage rate—remuneration for the time spent at work; \( H \) represents hours spent at work; \( K \) is non-labour income; \( T \) is the total time endowment available, and \( L \) is leisure. Given the above functions, the consumer problem will be specified as follows;

\[ \text{Max} \ U(WH + K, T - H) \text{subject to } Y = WH + K \]  \hspace{1cm} (4)

In this theory, consumption and labour supply decisions can be thought of as complementary behaviours whereby an individual selects \( C > 0 \) and \( H \geq 0 \) that maximises utility (1) subject to the budget constraint (2; Ntuli, 2007). As such, the first-order conditions will take the following form;

\[ U_c = (WH + K, T - L) = \lambda U_L = (WH + K, T - L) \geq \lambda W \]  \hspace{1cm} (5)

In equation (5), \( \lambda \) represents the marginal utility of income. This equation gives the market demand function for commodities and the condition for the maximum possible allocation of time between leisure and working hours. If the inequality in equation (5) holds strictly, the individual would not be allocating time to work, which means all the time will be allocated for leisure (\( L = T \)). In the presence of wage, \( W_r \), such that \( U_L(WH + K, T - L) = \lambda W_r \), an individual would not work for a wage below this reservation wage. According to Ntuli (2007), the decision rule is that the individual participates if and only if the expected market wage offer (\( W \)) is greater than the reservation wage (\( W_r \)). The amount of time devoted to working is subject to a similar decision-making process applied to labour market participation. Chaykowski and Powell (1999) stated that this decision has two opposing effects where on the one hand, a higher wage rate will induce an individual to work more hours (the substitution effect) while, on the other hand, it can afford the individual more leisure time (the income effect).

In as much as the Worker-Leisure Choice theory does not explicitly include social and psychological factors in the prime goal of utility maximisation, it is essential to note that factors such as cognitive, motivation and emotions are critical in shaping the labour market decision process (Dohmen, 2014; Kaufman, 1999; McGovern, 2003). Empirical evidence on the labour market behaviour of women reveals the sensitivity of the labour force participation decision and the supply of hours of work to wages and the degree to which other economic, social and demographic variables affect labour supply decisions (Chaykowski & Powell, 1999). The theory is expanded to incorporate gender-based violence (i.e. sexual, domestic and IPV) costs in female labour supply models. As with the case of the traditional neoclassical theory where women make decisions to participate in the labour market based on the wage rate, in this case, sexual violence would enter into the women’s labour force participation decision.

3.1.2. Human capital theory

According to human capital theory, increases in a person’s stock of knowledge or human capital raise her productivity in the market sector of the economy, where she produces money earnings, and in the non-market or household sector, where she produces commodities that enter her utility function.
(Grossman, 2000). The basic idea of this theory suggests that for individuals to realise potential gains in productivity, they have to invest in formal schooling and on-the-job training as well as health care. Due to the causal link between health and education, human capital theory is now being used to analyse factors such as violence against women that influence labour market outcomes. The use of the theory emanates from the line of thinking, which states that; violence against women may also affect a woman’s economic well-being through its effect on her health (Chegere & Karamagi, 2020). In this theory, educated people efficiently produce health investments. Given that sexual violence affects women’s health, it tends to lower her health capital, which is a critical determinant to women’s decision on the total amount of time available for market and non-market activities.

3.1.3. Modernisation theory

Modernisation theory argues that, as societies industrialise and further develop, the influence of social background and other ascribed characteristics on educational and socio-economic outcomes declines, while achievement in the education systems becomes vital (Marks, 2009). According to modernisation theorists, economic development is positively associated with FLFP through a change in the country’s occupational structure (i.e. the increasing availability of service and white-collar jobs) and increased educational opportunities, often accompanied by reduced female fertility rates and household responsibilities (Abraham et al., 2017). Therefore, the process of modernisation is associated with an increased demand for labour and a universal social acceptance of women’s education and employment.

The Modernisation theory stresses that education positively impacts women’s labour force participation regardless of socio-economic background. The theory also states that with modernisation, gender inequalities and traditional beliefs that suppress women would decrease, thus causing the country to develop through FLFP. Thus, increasing FLFP means that women are beneficiaries of modernisation. Given that modernity is independent of religion and cultural beliefs, the leading causes of violation of women rights, perpetration of crimes of sexual violence though not considered in this model, is expected to influence FLFP.

2.2. Empirical literature review

The increased importance of FLFP participation in the economic development of nations has prompted research on women’s labour market activities. Most of the empirical literature on sexual violence and FLFP were conducted in relatively advanced economies. The empirical literature on this topic is scant in developing economies, particularly in Africa.

Sabia et al. (2013) examined the relationship between sexual violence against women and labour market outcomes in the US using data drawn from the National Longitudinal Study on Adolescent Health. The study employed the Ordinary Least Squares estimation technique to analyse the effect of sexual violence on women’s labour force participation and earnings. The study used two dependent variables (i.e. labour force participation and hourly earnings) to check the different effects of sexual violence on these labour market outcomes. Sabia et al. (2013) found that sexual violence is associated with a 6.6 per cent decline in female labour force participation and a 5.1 per cent decline in women’s earnings.

A similar study was conducted by Loya (2015) using US data to examine how sexual violence affects adult female survivors’ employment and economic well-being. The study conducted bivariate and multivariate analyses using linear and logit regression models to investigate the impact of sexual violence on survivors’ employment and earnings. The study found that sexual violence affects employment and earnings primarily through its known effects on survivors’ mental health and sense of safety. The study also observes that on top of the trauma of sexual victimisation, survivors of this crime face financial consequences due to decreased earnings and barriers to employment.

Chakraborty et al. (2017) investigated the effect of crime (sexual violence) against women on labour force participation in India. The study’s objective was to inquire how the perception of
getting sexually harassed affected women’s labour force participation rate through the direct and implicit costs related to travelling to work. The study found that women are less likely to work outside the home in regions where the threat of sexual harassment is high.

In a related Indian study, Siddique (2018) found labour force participation for urban women to be decreasing as media reports of sexual violence increased in one’s local area. The study’s objective was to investigate the relationship between media reported sexual violence and female labour supply in urban areas of India. The study also found that the impact of violence on female labour supply is positive and significant at a 5% level for poor women based on social status. These results imply that due to their vulnerability to poverty, they have economic incentives to devise strategies that help in overcoming their fear.

In a comparative study, Hosney (2016) examined factors that influence FLFP in Egypt and Germany. This study employed a probit model to investigate factors that influence FLFP in both countries. Similar to this study, Benefo and Pillai (2003) evaluated the determinants of female non-family work in Ghana and Zimbabwe using the logit model. Hosney (2016) found that in both Germany and Egypt, FLFP is positively influenced by factors such as years of schooling and age and negatively impacted by being a married woman, living in urban areas and the number of children. In Ghana and Zimbabwe, the traditional kinship-oriented family organisation in Africa, along with high fertility, are the main constraints to women’s labour force participation, particularly in seeking formal employment.

Using the Tanzanian National Panel Survey (2008–2009) data, Chegere and Karamagi (2020) examined the effect of IPV on women’s employment and earnings. The study used a probit model to estimate the impact of IPV on the probability of women’s employment. Chegere and Karamagi (2020) found that a woman who has suffered IPV in her lifetime or the current period is more likely to pursue self-employment than the one who has not. The authors explained this as a strategy by women experiencing violence to get their financial freedom, reducing some friction that led to them being victims. The authors highlighted that self-employment is easy to pursue since obtaining wage employment would require some certificates and may take longer.

Using a binomial logit model in Zimbabwe, Chikwanha and Ncube (2014) evaluated determinants of labour force participation of married women using data collected from 514 female respondents from different socio-economic backgrounds. The author measured labour force participation as the activeness of women in paid, permanent work. On the independent variables, the authors did not include any of the gender-based violence types (IPV, sexual violence or domestic violence) as a factor that influences FLFP. Among those variables included in the study, age, education attainment, work experience, geographical location, religious denomination, and the amount of non-labour income earned are the significant determinants of married women’s decision to work. The study focused on the labour force participation of married women and did not look at factors that affect women’s earnings in Zimbabwe and left out other groups of women and girls who are active economically. Therefore, it is essential to examine the nexus between sexual violence and FLFP in Zimbabwe.

3. Methodology

3.1. Conceptual framework

The literature on sexual violence against women and labour market outcomes suggests that the threat of victimisation and adverse physical and psychological effects of sexual violence determine women’s decision to work (Chakraborthy et al., 2017; Loya, 2015). Therefore, to come up with a framework that explains how sexual violence against women influences FLFP, the study follows the Worker-Leisure Choice theory and empirical works of Sabia et al. (2013), Loya (2015), Chakrabarty et al. (2017), and Siddique (2018). In line with these studies, the decision to work will be captured as to whether a woman is working outside the home for pay or not. Therefore, the latent decision to work by women is denoted as;
\[
\text{Work} = \begin{cases} 
1 & \text{if utility derived from working is } \geq \text{ the cost incurred from working} \\
0 & \text{Otherwise}
\end{cases}
\] (6)

Formally, the decision to work can be captured through a net utility of work expressed as follows;

\[U = U(w - c)\] (7)

In the above expression, \(U\) represents the utility derived from work, \(w\) is the wage rate, and \(c\) is the cost associated with going to work. The cost associated with going to work also involves the threat of victimisation and financial and non-financial costs incurred by the victim when dealing with the physical and psychological consequences of sexual violence. According to Chakraborty et al. (2017), the probability of women participating in the labour force can be presented as;

\[\Pr(\text{Work}) = \Pr(U(w - c) \geq \theta)\] (8)

Where \(\theta\) represents the disutility of working outside the home or the reservation income. Due to the mental health consequences of sexual violence, the survival strategies that women may come up with to deal with the reality of being a victim of such a crime may influence the decision to participate in the labour force. Chakraborty et al. (2017) assert that cost comprises the monetary cost of travelling to work and the expected victimisation cost. Of particular interest is the expected victimisation cost, which captures the monetary cost of hospitalisation of the victim and psychological cost, which depends on how local religion or culture values chastity. Thus, trauma increases the cost of women who get sexually violated, which leads to a low probability of labour force participation.

Since FLFP is a dichotomous dependent variable that takes value 1 for women working outside their homes and 0 otherwise, a binary response regression model (logit) is employed in this study. The logit model is chosen for its simplicity in interpretation. It is critical to understand that the estimation of the logit model is done by maximum likelihood because the Bernoulli model defines the distribution of the data. An important assumption of this model is that its error term follows a logistic distribution. Borrowing from Gujarati (2003) and Cameron and Trivedi (2005), the functional form of the model is presented as;

\[P_i = E(Y = 1|X_i) = \beta_1 + \beta_2 X_i\] (9)

Where \(X_i\) represents a vector of explanatory variable and \(P_i\) is the probability that a woman will be working outside her home. The expression (9) can be written as;

\[P_i = E(Y = 1|X_i) = \frac{1}{1 + e^{-\beta_1 X_i}}\] (10)

For ease of exposition, the expression can be transformed into the following equation;

\[P_i = \frac{e^Z_i}{1 + e^Z_i} = \frac{e^{Z_i}}{1 + e^{Z_i}}\] (11)

Where \(Z_i = \beta_1 + \beta_2 X_i\) and equation (11) are referred to as the cumulative logistic distribution function. Given the above expression, it can easily be verified that as \(Z_i\) ranges from \(-\infty\) to \(+\infty\), \(P_i\) ranges between 0 and 1 and that \(P_i\) is nonlinearly related to \(Z_i\) (i.e. \(X_i\)), thus satisfying the two requirements that as \(Z_i \rightarrow +\infty\), \(e^{-Z_i}\) tends to zero and as \(Z_i \rightarrow -\infty\), \(e^{-Z_i}\) increases indefinitely (Gujarati, 2003). Satisfying these requirements created an estimation problem since \(P_i\) is nonlinear in \(X_i\) and \(\beta_2\)'s, so we cannot use the OLS method to estimate the parameters (ibid). The above expression can be linearised as follows;

If \(P_i\) in the above expression is the probability of a woman working outside her home, then \((1 - P_i)\), the probability of not working outside her home, is;

\[1 - P_i = \frac{1}{1 + e^{Z_i}}\] (12)
Given equation (12), the odds ratio, which is the ratio probability of working outside the home to not working outside the home, can be expressed as:

\[
\frac{P_i}{1 - P_i} = \frac{1 + e^{z_i}}{1 + e^{-z_i}} = e^{z_i}.
\] (13)

Transforming equation (13) using natural logarithms, we get the following equation;

\[
L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = Z_i = \beta_1 + \beta_2 X_i
\] (14)

Where \(L_i\) is the log of odds ratio, which is linear in \(X\) and (from the estimation viewpoint) linear in the parameters (ibid). Thus, for estimation purposes, the full logit model is written as;

\[
L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = Z_i = \beta_1 + \beta_2 X_i + \mu_i
\] (15)

### 3.2. 3.2. Empirical model

To empirically examine the relationship between sexual violence and FLFP in Zimbabwe, the study borrows from the works of Sabia et al. (2013), Loya (2015), Chakraborty et al. (2017), and Siddique (2018). However, the models are modified to suit the Zimbabwean environment and the estimation techniques to be used. The FLFP model is expressed as follows;

\[
FLFP = F\left(\text{SexViolence, SexViolence}_2, \text{Educ, Age, Agesqr, Relig, MarStat, Location, HEStat, NChild, Perpt}\right)
\] (16)

Alternatively, since we are using the logit model to estimate the impact of sexual violence on FLFP, the model can be expressed as;

\[
P(FLFP = 1|X) = \beta_0 + \beta_1 \text{SexViolence} + \beta_2 \text{Educ} + \beta_3 \text{Age} + \beta_4 \text{Agesqr} + \beta_5 \text{MarStat} + \beta_6 \text{Location} + \beta_7 \text{NChild} + \beta_8 \text{HEStat} + \beta_9 \text{Relig} + \beta_{10} \text{SexViolence}_2 + \beta_{11} \text{Perpt} + \mu_i
\] (17)

Where;

- **FLFP**: is the dependent variable which takes a value of 1 if a woman works outside her home and zero otherwise.
- **SexViolence**: capturing the effect of sexual violence experienced by women in their lifetime. The variable carries a value of one for those respondents who report having been physically forced to have any sexual activity without their consent or against their will and zero otherwise. Sabia et al. (2013) and Loya (2015) found that sexual violence negatively impacts FLFP. The study also expects the variable to impact FLFP negatively.
- **SexViolence\_2**: capturing the effect of the current sexual violence which was experienced in the past 12 months. The measurement of this variable is like that of SexViolence. The variable is expected to have a negative effect on FLFP.
- **Educ**: measures the level of formal education attained by women. The variable is coded as follows; No formal education = 0; Primary education = 1; Secondary education = 2 and Tertiary education = 3. As Hosney (2016) found in a comparative study in Egypt and Germany that education positively impacts FLFP, this study expects the same.
- **Age**: measures the years of an individual woman. Age has a significant positive effect on women’s employment status, indicating that older women are more likely to work outside their homes (Chakraborty et al., 2017). Thus, the variable is expected to have a positive impact on FLFP in Zimbabwe.
**Agesqr**: is the square of years of an individual woman, which is used to capture the effect of ageing. Siddique (2018) observed that as age increases, women’s labour force participation first increases (with a positive coefficient on Age) and then decreases beyond a certain age as years continue to add on a woman’s life (with a negative coefficient on Agesqr). Chakraborty et al. (2017) share the same results that the negative coefficient on the quadratic of age shows that the effect reverses after a certain age level. Thus, Agesqr is expected to have a negative impact on FLFP.

**MarStat**: represents the marital status of a women which is measured as follows; single = 0, married = 1, divorced = 2, widowed = 3. Chakraborty et al. (2017) found that marital status negatively affected women’s decision to work and income is also negatively affected if household income increases. Thus, being married is associated with a low probability that a woman would go to work.

**location**: represents the area of women’s residence. Urban residents are significantly more likely to pursue non-family work such as domestic and extra-domestic work than rural residents (Benefo & Pillai, 2003). In the same vein, women living in urban areas are expected to earn higher than their rural counterparts due to their access to higher education and opportunities. The variable is categorised as follows; rural = 0 and urban = 1.

**NChild**: is the number of children below the age of 14 years that a woman has. Hosney (2016) found that an increase in the number of children significantly impacts females’ decision to participate or opt-out of the labour market. In this regard, low fertility and birth rates can be critical elements that induce females to participate in the labour market. We expect the variable to impact the women’s decision to work negatively.

**HEStat**: is the household economic status measured as the level of household income in Zimbabwean dollars. The variable will use monthly earnings as a proxy. Chakraborty et al. (2017) found that household economic status negatively impacts FLFP. Thus, in this study, it is also expected to affect women’s decision to work negatively. The variable has 4 categories which are as follows; 1 = 0–50,000; 2 = 50,001–75,000; 3 = 75,001–100,001 and 4 = 100,001 and above.

**Relig**: represents the belief of an individual woman. Studies by Hosney (2016) and Siddique (2018) found that women associated with less liberal religions have a low labour force participation rate compared to those with liberal religions. Thus, the variable will be categorised as follows: Apostolic sect = 0; Traditional beliefs = 1; Other Christian churches = 3 and Other religions = 4.

**Perpt**: the perpetrator of sexual violence. The inclusion of this variable is informed by Sabia et al. (2013), who found out that the effects of this crime are strong when the perpetrator is a non-family member compared to parents and resulted partly due to stress-related to psychological and physical consequences. Therefore, it is crucial to check how this variable affects women’s decision to work in Zimbabwe.

\[ \mu \] is the error term.

### 3.3. Data sources and collection

The study used cross-sectional survey data collected from two districts of Mashonaland West province: Zvimb and Hurungwe Districts. The data was collected in March 2021 with the assistance of Caritas Zimbabwe and Spotlight Initiative, organisations working with women under the UN Women programmes in this province. The target population were women aged 15–64 years who were regarded as economically active in Zimbabwe. A pre-coded structured questionnaire was used to collect the quantitative data which was used in this study. The questionnaire was put through a pre-pilot and pilot study to test its validity, reliability, and acceptability in data collection. The test for validity, reliability and acceptability of the questionnaire used ten females, which is 3.3% of the sample size. The pre-test sample is informed by Fink (2009) as cited in Akinci and Saunders (2015) that for small projects, the minimum number of a pilot trial is 10 respondents.
3.4. Sample size and sampling procedure
The sample size is a significant feature of any empirical study in which the goal is to make inferences about a population from a sample (Taherdoost, 2017). The sample size needs to be representative or large enough to generalise from a random sample and avoid sampling errors or biases. The sample size \( n \) is determined using Cochran’s (1977) formula articulated by Israel (2003);

\[
\text{Sample size } n = \frac{Z^2 \rho (1 - \rho)}{e^2}
\]

\( Z \) is the value corresponding to the required confidence level, \( \rho \) is the percentage occurrence of a state or condition, and \( e \) is the maximum required error. A 95\% confidence interval value of 1.96 is used for this study to determine the sample size. The value of \( \rho \) is difficult to determine, but Bartlett et al. (2001), as cited in Taherdoost (2017), suggest that researchers should use 50\% as an estimate of \( \rho \), as this will result in the maximisation of variance and produce the maximum sample size. The study will use 6\% as the maximum allowable error. Given these values, the sample size is 267 respondents, but 315 questionnaires were deployed to cater to those who would commit errors and not complete the questionnaire. After the data gathering process, 301 questionnaires were found to have been completed correctly and eligible for use in this study, thus reducing the minimum allowable error to 5.6\%.

The study employed a multistage sampling approach. Firstly, two districts, Zvimba and Hurungwe of Mashonaland West Province, were purposively selected from a pool of 7 districts for the study based on their ease of accessibility due to good road networks. Secondly, seven wards (4 in Hurungwe and 3 in Zvimba) were purposively chosen from those in which Caritas Zimbabwe and Spotlight Initiative are jointly working. Thirdly, a simple random sampling technique was applied to proportionately select respondents, where bigger wards contribute more to the sample.

3.5. Ethical considerations
The study applied ethical guidelines prescribed by the Department of Economics and Development under the University of Zimbabwe. A formal letter was obtained from the Department of Economics and Development, granting permission to collect data in Mashonaland West Province. Before carrying out the data collection process, the researcher availed information regarding the study’s objectives to the respondents and ensured that the information collected would remain confidential, private and anonymous. The respondents were informed of their right to withdraw from the study at any time, and they were free to leave some questions unanswered. After reaching an agreement, the respondents signed the consent form. The data collection process was supported by the Caritas Zimbabwe’s social workers who assisted in providing psychosocial support to the victims of sexual violence.

3.6. Model diagnostic tests
Pre-estimation and post estimation tests are essential when running a logit model. A correlation test was conducted using the correlation matrix and considered only the pairwise correlation to check the linear dependence of the regressors. The linktest was conducted to check if there are omitted variables and/or incorrect model functional form. Finally, the Hosmer-Lemeshow test was used to check the model’s goodness of fit, where a high \( p \)-value is interpreted to mean that the model is of a good fit.

4. Results and discussion
This study aims to examine the effects of sexual violence on FLFP using data from Mashonaland West province. This section presents descriptive statistics first and then econometric results. The study used STATA version 15 to estimate results.
4.1. Descriptive statistics
The first section provides descriptive statistics of the categorical explanatory variables by the FLFP, the labour outcome variable. Secondly, the labour outcome variable is analysed against all the continuous independent variables, with the same objective of understanding how women's labour outcomes (FLFP) vary by individual, group and or environmental characteristics. A similar analysis is also conducted for the earnings variable, the second main dependent variable of the study. The chi-square and t-tests are used to analyse categorical independent variables and continuous independent variables, respectively.

4.1.1. Descriptive statistics of categorical independent variables by FLFP
The analysis of the relationship between categorical regressors and FLFP shows that sexual violence, education, religion and perpetrators were statistically significantly different between women working outside the home for pay and those not working outside the home for pay. A small proportion of the respondents experienced sexual violence in their lifetime (29.57%), and the difference in sexual violence between women working outside the home for pay and those not working outside the home for pay was statistically significant (p < 0.05). Of the women who work outside the home for pay, 24.86% experienced sexual violence in their lifetime, while 75.14% did not. Some 35.94% of women who are not working outside the home for pay experienced sexual violence in their lifetime, while 64.06% did not.

A difference in FLFP across educational attainment levels was statistically significant (p < 0.01). The majority of the respondents attained secondary education (44.52%), followed by those with primary education (31.23%), then tertiary education (17.61%) and no formal education (6.64%). Women who attained secondary education dominated the group working outside the home for pay (36.99%) and those not working outside the home (54.69%). Based on religion, most women go to other Christian churches (52.16%), and the difference in this variable between working outside the home for pay and not is statistically significant (p < 0.1). Some 58.38% of women working outside the home for pay go to other Christian churches compared to only 43.75% of those not working outside the home for pay.

Furthermore, statistics in Table 1 show that a greater proportion of women (9.83%) who work outside the home for pay were violated by their intimate partners. For those who responded that they do not work outside the home for pay, the main perpetrators were strangers (9.38%). The difference in perpetrators between working outside the home for pay and not working outside the home for pay is statistically significant (p < 0.1).

4.1.2. Descriptive statistics of continuous independent variables by FLFP
The descriptive statistics in Table 2 show that all the means for the continuous independent variables are statistically insignificant in explaining the differences between working outside the home for pay and not working outside the home for pay.

4.2. Econometric results
Using STATA 15’s Pearson's correlation matrix tables, the multicollinearity results showed that Age and Agesqr (0.987) are independent variables with a correlation value above +.8. Separate models were estimated testing the validity of these variables, and the results led to the dropping of Agesqr and Perpetrator as the unrestricted model with Age and SexViolence were more appropriate and meaningful. The results are attached as Appendix A. The goodness of fitst for the logit model was done using the Hosmer-Lemeshow test, and it was found that the model is of a good fit with a p-value of 0.4777. The Hosmer-Lemeshow test results are attached as Appendix B. The model specification test was conducted through the linktest, and the results showed that the model was correctly specified. Appendix C shows the results of the linktest.

The econometric model results presented in Table 3 (full logit model estimation and marginal effects are attached as Appendices D and E) showed that education, sexual violence experienced
by women in their lifetime, and sexual violence experienced in the past 12 months were statistically significant in influencing FLFP. Education (Educ) and sexual violence experienced by women in their lifetime (SexViolence) met the priori expectations while sexual violence experienced in the past 12 months (SexViolence_2) did not.

Educational attainment was significant at 5% level for those who attained secondary education and at 1% level for those who received primary and tertiary education. The results show that there is a positive relationship between educational attainment and FLFP. Compared to women who did not receive a formal education, those who attained primary education, secondary education and tertiary education were 32.6%, 23% and 68.1%, respectively, more likely to participate in the
 labour market. The findings also conform with the human capital theory, which states that increasing human capital investments, i.e. education increases the chances of participating in the labour market. These results corroborate those found by studies done by Chikwanha and Ncube (2014) in Zimbabwe and Hosney (2016) in Egypt and Germany that education positively impacts FLFP. Since the results show that attaining higher levels of education increases the likelihood of women participating in the labour market, the government needs to introduce policies that promote greater access to higher levels of education to achieve higher levels of FLFP.

The experience of sexual violence by women in their lifetime (SexViolence) was significant at a 1% level. Women who experienced sexual violence in their lifetime are 21.9% less likely to participate in the labour force compared to those who did not experience sexual violence. These results are consistent with the studies by Sabia et al. (2013) in the USA, Loya (2015) in the USA, Chakraborthy et al. (2017) in India and Siddique (2018) in India, who found that sexual violence and perception of this crime negatively impacts women’s labour force participation. The impact of sexual violence experienced over a lifetime on FLFP implies that the government and other stakeholders concerned about the welfare of women need to act towards reducing this crime. Measures that can be taken include introducing programmes that educate communities about the consequences of sexual violence to women. There is a need for providing counselling services and publicising available services to survivors. In the fight against this crime, government departments such as the Police’s Victims Friendly Unit needs to have a presence in all parts of the country and be capacitated with resources such as motor vehicles.

Sexual violence experienced in the past 12 months preceding the survey (SexViolence_2) was found to positively impact FLFP. The variable is significant at the 1% level. Compared to those who did not experience sexual violence in the last 12 months, women who were sexually violated during the same period are 27% more likely to participate in the labour market. These results contradict those found by Sabia et al. (2013) that sexual violence experienced in the past 12 months negatively impact FLFP. These results conform with Siddique (2018), who found that based on social status in India, violence against women positively impacts the labour market participation of poor women. The positive impact of sexual violence on FLFP implies that due to their vulnerability to poverty, they have economic incentives to devise strategies that bring them freedom from this crime. To strengthen survivors’ labour force participation behaviour, the government should ensure that victims get psychological and legal support.

5. Conclusion and recommendations
The study attempted to explore whether sexual violence influence FLFP in Zimbabwe or not, using the case of Mashonaland West province. The study used a self-administered questionnaire to answer this research question using cross-sectional data collected from 301 women in March 2021. A binary logit model was estimated to examine the impact of sexual violence on FLFP. The study’s main findings showed that sexual violence and education are essential factors
influencing women’s participation in the labour force. Interesting results were obtained on the impact of sexual violence as the lifetime experience of this crime was found to have a negative impact on FLFP while the experience of this crime in the past 12 months had a positive impact on the same. Given the results of this study, the study recommends:

- That the government should consider introducing awareness programs that educate communities about the consequences of sexual violence, available services, and the future of survivors. The government should convince community leaders to lead the fight against sexual violence.
violence and change the harmful practices that suppress women and make them susceptible to this crime.

- Women should be encouraged to speak up against sexual violence and to report to the Police all cases that occur in their communities.
- The Victims Friendly Unit of the Zimbabwe Republic Police needs to be capacitated with resources (offices and vehicles) to effectively discharge their services to victims of sexual violence.
- There is a need to provide free health services (mental health care and counselling) to victims of sexual violence, so that they do not engage in avoidance strategy which may cause them to withdraw from the labour market. The government needs to provide emergency shelter for victims of sexual violence whilst the cases are at the courts as this would give confidence to the affected parties that their safety is guaranteed.
- Furthermore, through its ministries responsible for education, the government should develop policies that promote greater access to higher levels of education by women in Zimbabwe. One of the policies could be making education up to secondary level compulsory and free for women and subsidising their tertiary education.

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Notes
1. SDG 5 seeks to achieve gender equality and empower all women and girls
2. SDG 8 seeks to promote inclusive and sustainable economic growth, full and productive employment and decent work for all.

3. Recall that $e = 2.71828$.

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No potential conflict of interest was reported by the author(s).

References
Abbas, Q. (2001). Endogenous growth and human capital: A comparative study of Pakistan and Sri Lanka. Pakistan Development Review, 40(4II), 987–1007. https://doi.org/10.30541/v40i4IIpp.987-1007
Abraham, A. Y., Ohemeng, N. F. A., & Ohemeng, W. (2017). ‘Female labour force participation: Evidence from ghana participation. International Journal of Social Economics, 44(11), 1489–1505. https://doi.org/10.1108/IJSE-06-2015-0159
Akinci, C., & Saunders, M. (2015). Using questionnaire surveys to gather data for within organisation HRD research. In M. Saunders & P. Tosey (Eds.), Handbook of research methods on human resource development (pp. 217–230). Edward Elgar.
Barnett, J. E., Kotlik, J. W., and Higgins, C. C. Learning and Performance Journal, 19, 43-50, 2001
Organizational Research: Determining Appropriate Sample Size in Survey Research. Learning and Performance Journal 19 43-50
Benefo, K. D., & Pillai, V. K. (2003). Determinants of women’s non-family work in Ghana and Zimbabwe. Canadian Studies in Population, 30(2), 389. https://doi.org/10.25336/PENG60
Berlo, W. V., & Ploem, R. (2018). Sexual Violence AA3047SE (Utrecht, Netherlands: Rutgers) Accessed 1 May 2021 https://rutgersinternational/wp-content/uploads/2021/09/knowledge_file_Sexual_violence.pdf
Bows, H. (2016). ‘Sexual violence’, In A companion to crime, harm and victimisation Policy Press.
Cameron, C. A., & Trivedi, P. K. (2005). Microeconometrics: methods and applications. Cambridge University Press.
Chakraborty, T., Mukherjee, A., Rachapalli, S.R., Saha, S. (2017) Stigma of sexual violence and women’s decision to work, IZA Institute of Labour Economics GLO Discussion Paper No. 96 IZA DP No. 10934 https://ftp.iza.org/dp10934.pdf .
Chaykowski, R. P., & Powell, L. M. (1999). Women and the labour market: Recent trends and policy issues. Canadian Public Policy / Analyse de Politiques, 25(1), 1-25. https://doi.org/10.2307/3552314
### Appendix A: Multicollinearity Tests correlate Age MarStatEducNChildRelig location HEStatSexViolence SexViolence_2 perpetrator Age2

| Variables | (1)     | (2)     | (3)     | (4)     | (5)     | (6)     | (7)     | (8)     | (9)     | (10)    | (11)    |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| (1) Age   | 1.000   |         |         |         |         |         |         |         |         |         |         |
| (2) Mar Stat | 0.420   | 1.000   |         |         |         |         |         |         |         |         |         |
| (3) Educ   | -0.243  | -0.213  | 1.000   |         |         |         |         |         |         |         |         |
| (4) NChild | -0.180  | -0.048  | -0.011  | 1.000   |         |         |         |         |         |         |         |
| (5) Relig  | -0.075  | -0.036  | 0.281   | -0.185  | 1.000   |         |         |         |         |         |         |
| (6) location | -0.134  | 0.013   | 0.234   | -0.039  | 0.162   | 1.000   |         |         |         |         |         |
| (7) HEStat | -0.066  | -0.048  | 0.173   | -0.106  | 0.104   | 0.257   | 1.000   |         |         |         |         |
| (8) Sex Violence | -0.031  | 0.086   | 0.035   | 0.026   | 0.035   | 0.097   | 0.112   | 1.000   |         |         |         |
| (9) Sex Violence_2 | -0.073  | -0.048  | 0.061   | -0.017  | 0.041   | 0.097   | 0.086   | 0.433   | 1.000   |         |         |
| (10) perpetrator | 0.030   | -0.091  | -0.003  | -0.003  | -0.001  | -0.076  | -0.156  | -0.863  | -0.370  | 1.000   |         |
| (11) Age2  | 0.987   | 0.420   | -0.268  | -0.249  | -0.070  | -0.135  | -0.043  | -0.021  | -0.064  | 0.021   | 1.000   |

### Appendix B: Goodness of Fit Test Logistic model for FLFP, goodness-of-fit test
(Table collapsed on quantiles of estimated probabilities)

- Number of observations = 301
- Number of groups = 10

Hosmer-Lemeshow chi2(8) = 7.56

\[ \text{Prob} > \chi^2 = 0.4777 \]
Appendix C: Model Specification Test for Logit Model—Link Test

Logistic regression
Number of obs = 301

LR chi2(2) = 68.75

Prob > chi2 = 0.0000

Log likelihood = −170.88459 Pseudo R2 = 0.1675

| FLFP   | Coef.  | Std.Err. | z     | P > z | [95%Conf.] Interval |
|--------|--------|----------|-------|-------|---------------------|
| _hat   | 0.965  | 0.170    | 5.690 | 0.000 | 0.632 - 1.297       |
| _hatsq | 0.044  | 0.093    | 0.480 | 0.632 | -0.137 - 0.226      |
| _cons  | −0.027 | 0.144    | -0.190| 0.853 | -0.308 - 0.255      |

Appendix D: Logit Model Estimation

| FLFP                  | Coef.  | St.Err. | t-value | p-value | [95% Conf] Interval | Sig    |
|-----------------------|--------|---------|---------|---------|---------------------|--------|
| Education             |        |         |         |         |                     |        |
| No formal education   | 0      | .       | .       | .       | .                   |        |
| Primary education     | 1.517  | .63     | 2.41    | .016    | .282 - 2.752        | **     |
| Secondary education   | 1.097  | .642    | 1.71    | .087    | −.161 - 2.355       | *      |
| Tertiary education    | 3.982  | .805    | 4.95    | 0       | 2.404 - 5.56        | ***    |
| Sex                   |        |         |         |         |                     |        |
| Violence              |        |         |         |         |                     |        |
| No                    | 0      | .       | .       | .       | .                   |        |
| Yes                   | −1.12  | .342    | −3.28   | .001    | −1.789 - −.45       | ***    |
| Sex Violence_2        |        |         |         |         |                     |        |
| No                    | 0      | .       | .       | .       | .                   |        |
| Yes                   | 1.605  | .612    | 2.62    | .009    | .405 - 2.804        | ***    |
| Age                   | .017   | .014    | 1.28    | .2      | .009 - .044         |        |
| NChild                | .121   | .109    | 1.11    | .268    | −.093 - .334        |        |
| Relig                 |        |         |         |         |                     |        |
| Apostolic sect        | 0      | .       | .       | .       | .                   |        |
| Traditional beliefs   | .705   | .616    | 1.14    | .252    | −.502 - 1.911       |        |
| Other Christian churches | .339 | .309    | 1.10    | .272    | −.266 - .944        |        |

(Continued)
| FLFP                  | Coef. | St.Err. | t-value | p-value | [95% Conf Interval] | Sig |
|----------------------|-------|---------|---------|---------|---------------------|-----|
| Other religions      | -.485 | .714    | -0.68   | .497    | -1.884              | .915|
| location             |       |         |         |         |                     |     |
| Rural                | 0     | .       | .       | .       |                     |     |
| Urban                | .08   | .291    | 0.28    | .782    | -.49                | .65 |
| HEStat               |       |         |         |         |                     |     |
| 0–50,000             | 0     | .       | .       | .       |                     |     |
| 50,001–75,000        | -.429 | .386    | -1.11   | .267    | -1.186              | .328|
| 75,001–100,000       | -.302 | .512    | -0.59   | .556    | -1.305              | .702|
| 100,001–150,000      | .044  | .797    | 0.06    | .956    | -1.518              | 1.606|
| MarStat              |       |         |         |         |                     |     |
| Single               | 0     | .       | .       | .       |                     |     |
| Maried               | .1    | .424    | 0.24    | .814    | -.731               | .93 |
| Divorced             | .281  | .551    | 0.51    | .61     | -.799               | 1.36|
| Widowed              | .027  | .595    | 0.05    | .963    | -1.138              | 1.193|
| Constant             | -2.069| .935    | -2.21   | .027    | -3.901              | -.237|

| Mean dependent var   | 0.575 | SD dependent var | 0.495 |
| Pseudo r-squared     | 0.167 | Number of obs    | 301.000 |
| Chi-square           | 53.569 | Prob > chi2      | 0.000 |
| Akaike crit. (AIC)   | 378.005 | Bayesian crit. (BIC) | 444.733 |

*** p < .01, ** p < .05, * p < .1
Appendix E: Average Marginal Effects for the Logit Model margins, dydx(*)
Average marginal effects Number of obs = 301

Model VCE: Robust

Expression: Pr(FLFP), predict()

dy/dx w.r.t.: 1.Educ 2.Educ 3.Educ 1.SexViolence 1.SexViolence_2 Age NChild 1.Relig 2.Relig 3.
Relig 1.location 2.HEStat 3.HEStat 4.HEStat 1.MarStat 2.MarStat 3.MarStat

|                   | dy/dx | Std.Err. | z    | P > z | [95%Conf. Interval] |
|-------------------|-------|----------|------|-------|---------------------|
| **Educ**          |       |          |      |       |                     |
| Primary education | 0.326 | 0.115    | 2.840| 0.004 | 0.101               |
| Secondary education | 0.230 | 0.117    | 1.970| 0.049 | 0.001               |
| Tertiary education | 0.681 | 0.112    | 6.100| 0.000 | 0.462               |
| **SexViolence**   |       |          |      |       |                     |
| Yes               | −0.219| 0.062    | −3.550| 0.000 | −0.339              |
| **Relig**         |       |          |      |       |                     |
| Traditional beliefs | 0.136 | 0.113    | 1.210| 0.228 | −0.085              |
| Other Christian churches | 0.067 | 0.061    | 1.100| 0.271 | −0.052              |
| Other religion    | −0.095| 0.138    | −0.690| 0.491 | −0.366              |
| **location**      |       |          |      |       |                     |
| Urban             | 0.016 | 0.057    | 0.280| 0.782 | −0.096              |
| **HEStat**        |       |          |      |       |                     |
| 50,001–75,000     | −0.084| 0.075    | −1.120| 0.262 | −0.232              |
| 75,001–100,000    | −0.059| 0.101    | −0.590| 0.556 | −0.257              |
| 100,001–150,000   | 0.009 | 0.155    | 0.060| 0.956 | −0.294              |
| **MarStat**       |       |          |      |       |                     |
| Married           | 0.020 | 0.083    | 0.240| 0.814 | −0.144              |
| Divorced          | 0.055 | 0.107    | 0.510| 0.610 | −0.156              |
| Widowed           | 0.005 | 0.117    | 0.050| 0.963 | −0.224              |

dy/dx for factor levels is the discrete change from the base level.
