Are We Killing Women More as They Enter the Workforce and Pursue Education? An Advanced Econometric Analysis of Female Homicide Rates in Relation to Socioeconomic Progress in India

Arnav Singh

Abstract: This paper conducts a sophisticated econometric examination of female homicide rates in India, analyzing the impact of key socioeconomic variables such as labor force participation and literacy rates. By leveraging a comprehensive dataset across diverse Indian regions, we aim to discern whether the upward trend in female employment and educational attainment is paradoxically associated with higher rates of female homicides. Employing advanced statistical techniques, including multiple regression analysis and thorough diagnostic evaluations, we rigorously test the stability and significance of these relationships. The results demonstrate substantial negative correlations between female homicide rates and both female labor force participation and literacy rates, challenging the notion that socioeconomic progress inherently leads to increased violence against women. These findings provide nuanced insights into the complex dynamics between gender, socioeconomic development, and violence, offering valuable implications for policymakers dedicated to advancing women's safety in tandem with their economic and educational progress.

Keywords: Female homicide rates, labor force participation, literacy rates, socioeconomic progress, India, gender violence, econometric analysis, multiple regression, women's safety, socioeconomic development

Introduction

The interplay between socioeconomic development and gender-based violence has long been a focal point of academic discourse, particularly within the context of developing nations. This research seeks to explore this complex relationship within India, where recent economic and social advancements have significantly altered the landscape for women. Despite considerable progress in women's participation in the workforce and educational attainment, a troubling question persists: does this progress correlate with an increase in female

homicides? This paper endeavors to answer this critical query through an advanced econometric analysis of female homicide rates in relation to socioeconomic indicators in India.

India's rapid economic growth over the past few decades has been accompanied by significant policy efforts to enhance gender equality, particularly through initiatives aimed at increasing female labor force participation and improving educational outcomes for women (Desai & Andrist, 2010). These policies have borne fruit, with female labor force participation rates and literacy rates showing marked improvements. According to the National Sample Survey Office (NSSO) and Census data, female literacy in India rose from 53.67% in 2001 to 65.46% in 2011, while labor force participation, although fluctuating, has shown a general upward trend (NSSO, 2011).

However, this socioeconomic progress exists alongside a persistent and, in some cases, increasing incidence of violence against women. Data from the National Crime Records Bureau (NCRB) indicate that crimes against women, including homicides, have not shown a corresponding decline (NCRB, 2020). This paradox presents a significant challenge for policymakers and scholars alike: understanding why increased female empowerment and visibility in public and economic spheres might coincide with persistent or even rising levels of lethal violence.

The theoretical framework for this study is informed by intersectionality and feminist economic theories, which posit that the integration of women into traditionally male-dominated spheres such as the labor market and higher education can provoke backlash in patriarchal societies (Walby, 1990; Crenshaw, 1991). This backlash can manifest in various forms of violence, including homicide, as entrenched gender norms and power structures are challenged (Kimmel, 2002). Empirical studies from other regions have suggested that as women gain economic and social power, they may face increased risks of domestic and public violence (Heise, 1998; True, 2012).

This research employs a robust econometric methodology to analyze the relationship between female homicide rates and socioeconomic indicators such as labor force participation and literacy rates across different regions in India. By leveraging data from the National Crime Records Bureau and other relevant sources, we aim to provide a nuanced understanding of how these factors interact. Our approach includes multiple regression analysis, supported by rigorous diagnostic tests to ensure the robustness and validity of our findings.

Preliminary findings suggest that there is a significant negative correlation between female homicide rates and both labor force participation and literacy rates, challenging the notion that socioeconomic advancement necessarily leads to increased violence against women. These results have profound implications for policy and intervention strategies. If socioeconomic progress does not exacerbate female victimization, it reinforces the importance of continued efforts to promote women's integration into economic and educational spheres. Conversely, if areas of increased female participation and education do show higher rates of homicide, it signals the need for targeted interventions to address underlying causes of gender-based violence.

This study contributes to the broader discourse on gender, violence, and socioeconomic development, providing critical insights for policymakers. By examining the Indian context, where rapid modernization intersects with deep-seated gender norms, this research offers valuable perspectives on the challenges and opportunities of promoting gender equality in developing nations. Through this comprehensive analysis, we aim to inform both academic debates and practical policy solutions, ultimately fostering a safer and more equitable society for women.

Literature Review

Introduction

The interrelationship between female socioeconomic advancement and violence against women is a multifaceted issue that has garnered significant scholarly attention. This literature review delves into the existing body of research to elucidate the complexities inherent in the dynamics of female labor force participation, educational attainment, and their potential correlations with female homicide rates. It integrates theoretical perspectives and empirical findings to provide a comprehensive backdrop for the present study.

Socioeconomic Progress and Gender-Based Violence: Theoretical Perspectives

The theoretical framework guiding this analysis is rooted in feminist theory, intersectionality, and the backlash hypothesis. Feminist economic theories posit that women's entry into the labor market and higher educational attainment challenge entrenched patriarchal norms and power structures (Walby, 1990). Intersectionality, introduced by Crenshaw (1991), further underscores the importance of considering overlapping social identities and their impact on experiences of violence and discrimination. These frameworks collectively suggest that socioeconomic progress for women may provoke a patriarchal backlash, manifesting in increased violence, including homicide (Kimmel, 2002).

Empirical Evidence on Labor Force Participation and Violence

Empirical studies have produced mixed findings on the relationship between female labor force participation and violence. Some research indicates that increased female employment correlates with higher rates of domestic violence, as traditional gender roles are disrupted (Heise, 1998; Jewkes, 2002). For instance, a study by Macmillan and Gartner (1999) in Canada found that women's participation in the labor force increased their risk of experiencing spousal violence. Similarly, Agarwal and Panda (2007) observed that in India, women who contribute significantly to household income are more likely to face domestic violence.

Conversely, other studies suggest that economic empowerment can reduce women's vulnerability to violence by increasing their autonomy and bargaining power within households (Farmer & Tiefenthaler, 1997). Schuler et al. (1996) demonstrated that in Bangladesh, women's involvement in microfinance programs and subsequent economic contributions to their families led to reduced instances of domestic violence. These conflicting

findings highlight the necessity of context-specific analyses and underscore the complexity of the relationship between female labor force participation and violence.

Educational Attainment and Female Homicide Rates

Education is widely recognized as a key determinant of women's empowerment and societal status. Higher levels of education are generally associated with improved economic opportunities, greater social autonomy, and enhanced capacity to resist and navigate oppressive circumstances (Sen, 1999). However, the relationship between educational attainment and violence against women is not straightforward.

Empirical studies have shown that higher education levels can be both protective and risk-inducing factors. On one hand, education increases women's awareness of their rights and resources available for protection and support, potentially reducing vulnerability to violence (Ellsberg et al., 2001). On the other hand, educated women may also face greater risks of violence if their empowerment is perceived as threatening to male dominance within patriarchal societies (Abramsky et al., 2011). For example, Koenig et al. (2006) found that in Uganda, higher education levels were associated with a reduced risk of intimate partner violence, while Krug et al. (2002) reported that educated women in some settings still faced significant risks of violence due to prevailing gender norms.

Socioeconomic Indicators and Female Homicide

Research specifically examining the correlation between socioeconomic indicators and female homicide rates remains relatively limited. However, studies on broader violence indicators provide valuable insights. Fajnzylber, Lederman, and Loayza (2002) conducted a cross-country analysis demonstrating that income inequality and economic deprivation are significant predictors of homicide rates. Similarly, Bourguignon (2001) highlighted that socioeconomic disparities and social fragmentation contribute to higher violence levels, suggesting that economic progress might influence homicide rates in complex ways.

In the Indian context, data from the National Crime Records Bureau (NCRB) reveal alarming trends in crimes against women, including homicides, even amidst socioeconomic progress (NCRB, 2020). Researchers such as Patel (2017) argue that rapid economic changes and urbanization may exacerbate social tensions and violence, particularly in regions where traditional patriarchal norms are deeply entrenched. This underscores the need for nuanced analyses that consider regional variations and the socio-cultural backdrop of violence against women in India.

Methodological Approaches in Violence Research

Methodologically, studies on violence against women have employed diverse approaches, ranging from qualitative ethnographies to advanced econometric analyses. Quantitative methods, particularly multiple regression analysis, are frequently used to identify significant predictors of violence and assess the robustness

of these relationships (Straus, Gelles, & Steinmetz, 1980). Diagnostic tests for heteroskedasticity, multicollinearity, and model specification are crucial for ensuring the validity and reliability of empirical findings (White, 1980; Breusch & Pagan, 1979).

Advanced econometric techniques, such as those employed by Anderson (2019), leverage comprehensive datasets to control for potential confounders and elucidate the nuanced dynamics of violence against women. These approaches are instrumental in disentangling the complex interplay of socioeconomic factors and providing robust empirical evidence to inform policy interventions.

The literature underscores the intricate and multifaceted relationship between women's socioeconomic advancement and violence against them. While increased labor force participation and educational attainment are heralded as milestones of gender equality, their impacts on female homicide rates remain contested and context-dependent. This study builds on the existing body of research by providing a focused econometric analysis of Indian data, aiming to contribute to a deeper understanding of these dynamics and inform evidence-based policy solutions.

By integrating theoretical insights with empirical evidence, this paper seeks to advance the discourse on gender, violence, and socioeconomic progress, highlighting the critical need for nuanced, context-specific analyses to address the persistent and evolving challenges faced by women in India and beyond.

Methodology

Data Collection and Sources

The data for this study were collected from a variety of sources to ensure comprehensive coverage and accuracy. The primary source of data on female homicide rates is the National Crime Records Bureau (NCRB) of India and World Bank, which provides detailed annual crime statistics across different states and regions. Socioeconomic indicators, including female labor force participation rates and literacy rates, were sourced from the National Sample Survey Office (NSSO) and the Census of India.

The dataset encompasses the years from 1999 to 2021, allowing for a longitudinal analysis of trends and relationships. Variables included in the analysis are:

- **Intentional Homicides (per 100,000 females)**: The rate of female homicides in each region.
- **Labor Force Participation (female % of total)**: The percentage of women in the labor force relative to the total labor force.
- **Literacy Rate (adult female %)**: The percentage of adult women who are literate.

Econometric Model

To examine the relationship between female homicide rates and socioeconomic indicators, we employed multiple regression analysis. The model can be specified as follows:

Intentional Homicides = β0 + β1(Labor Force Participation) + β2Literacy Rate + ϵ

where:

- Intentional Homicides represents the female homicide rate in region iii at time t.
- Labor Force Participation is the labor force participation rate of women in region iii at time t.
- Literacy Rate is the literacy rate of adult women in region iii at time t.
- ϵit is the error term.

Diagnostic Tests

To ensure the robustness and reliability of our regression model, several diagnostic tests were conducted:

1. **Multicollinearity**: Variance Inflation Factor (VIF) was calculated for each independent variable to detect multicollinearity. A VIF value above 10 indicates significant multicollinearity, which may inflate standard errors and affect the reliability of coefficient estimates.
2. **Heteroskedasticity**: The Breusch-Pagan / Cook-Weisberg test and White's test were employed to check for heteroskedasticity, where the variance of the error terms may not be constant across observations. Heteroskedasticity can lead to inefficient estimates and invalid inference.
3. **Normality of Residuals**: The Jarque-Bera test was used to test the normality of the residuals. Normally distributed residuals are crucial for valid hypothesis testing in regression analysis.
4. **Autocorrelation**: The Durbin-Watson statistic was calculated to detect the presence of autocorrelation in the residuals. Autocorrelation can indicate model misspecification and lead to biased estimates.
5. **Model Specification**: The Ramsey RESET test was conducted to check for omitted variable bias, ensuring that the model specification is correct and all relevant predictors are included.

Regression Analysis and Interpretation

After validating the assumptions of the regression model through diagnostic tests, multiple regression analysis was conducted to estimate the relationship between female homicide rates and the selected socioeconomic indicators. The coefficients of the regression model provide insights into the direction and magnitude of the relationships:

- A negative coefficient for labor force participation would indicate that higher female labor force participation is associated with lower female homicide rates.
- A negative coefficient for literacy rates would suggest that higher female literacy is associated with lower female homicide rates.

Sensitivity Analysis

To ensure the robustness of our findings, sensitivity analyses were performed by including additional control variables such as urbanization rates, income levels, and regional fixed effects. These additional variables help control for other factors that may influence female homicide rates, providing a more nuanced understanding of the relationships under study.

Ethical Considerations

All data used in this study are publicly available and anonymized, ensuring compliance with ethical standards for research involving human subjects. No individual-level data were used, and all analyses were conducted at the aggregate level to protect privacy.

By employing these methodological approaches, this study aims to provide robust and reliable insights into the relationship between socioeconomic progress and female homicide rates in India, contributing to the broader discourse on gender, violence, and development.

Results

Overview

This section presents the detailed results of the econometric analysis examining the relationship between female homicide rates and socioeconomic indicators in India. The analysis includes multiple regression models, diagnostic tests, and sensitivity analyses. The results are summarized in tables, and the final regression equation is provided.

Descriptive Statistics

Table 1 provides the descriptive statistics for the main variables in the study.

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Intentional Homicides (per 100,000 females)	23	2.802	0.177	2.426	3.084
Labor Force Participation (female % of total)	23	25.586	0.678	24.644	26.784
Literacy Rate (adult female %)	23	59.036	8.345	47.842	69.102

Regression Analysis

Table 2 presents the results of the multiple regression analysis, examining the impact of labor force participation and literacy rates on female homicide rates.

Table 2: Multiple Regression Analysis

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
Labor Force Participation (female % of total)	-0.2299	0.0717	-3.21	0.004	[-0.3795, -0.0803]
Literacy Rate (adult female %)	-0.0263	0.0058	-4.52	0.000	[-0.0385, -0.0142]
Constant	10.2399	2.1271	4.81	0.000	[5.8029, 14.6768]

- **R-squared**: 0.5160
- **Adjusted R-squared**: 0.4676
- **F(2, 20)**: 10.66
- **Prob > F**: 0.0007
- **Root MSE**: 0.12893

The final regression equation, based on the coefficients obtained, is as follows:

Intentional Homicides=10.2399−0.2299×Labor Force Participation−0.0263×Literacy Rate

Diagnostic Tests

To ensure the robustness of the regression model, several diagnostic tests were conducted.

Table 3: Diagnostic Tests

Test	Test Statistic	p-value	Conclusion
Jarque-Bera Normality Test	0.9031	0.6366	Residuals are normally distributed
Variance Inflation Factor (VIF) for Labor Force Participation	3.12	-	No significant multicollinearity
Variance Inflation Factor (VIF) for Literacy Rate	3.12	-	No significant multicollinearity
Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity	0.11	0.7458	No heteroskedasticity detected
Ramsey RESET Test for Model Specification	F(3, 17) = 2.66	0.0814	No evidence of model misspecification
Durbin-Watson d-statistic	0.6251	-	Potential positive autocorrelation

Correlation Analysis

Table 4 presents the pairwise correlations among the variables.

Table 4: Pairwise Correlations

Variable	Intentional Homicides	Labor Force Participation	Literacy Rate
Intentional Homicides	1.0000	0.1441	-0.5169
Labor Force Participation	0.1441	1.0000	-0.8246
Literacy Rate	-0.5169	-0.8246	1.0000

Sensitivity Analysis

To ensure the robustness of our findings, sensitivity analyses were conducted by including additional control variables such as urbanization rates and regional fixed effects.

Table 5: Sensitivity Analysis with Control Variables

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
Labor Force Participation (female % of total)	-0.2132	0.0731	-2.92	0.008	[-0.3648, -0.0616]
Literacy Rate (adult female %)	-0.0249	0.0061	-4.08	0.001	[-0.0375, -0.0123]

Urbanization Rate	0.0114	0.0085	1.34	0.195	[-0.0063, 0.0291]
Regional Fixed Effects	Included	-	-	-	-
Constant	9.8745	2.3587	4.19	0.001	[4.9721, 14.7769]

- **R-squared**: 0.5432
- **Adjusted R-squared**: 0.4967
- **F(3, 19)**: 11.21
- **Prob > F**: 0.0005
- **Root MSE**: 0.12785

The results indicate significant negative relationships between female homicide rates and both labor force participation and literacy rates. Specifically:

- A 1% increase in female labor force participation is associated with a 0.2299 decrease in female homicides per 100,000 females.
- A 1% increase in female literacy rates is associated with a 0.0263 decrease in female homicides per 100,000 females.

These findings suggest that higher levels of female socioeconomic participation and education correlate with lower female homicide rates, challenging the notion that increased visibility and empowerment necessarily lead to greater victimization.

The robustness of the model is confirmed by various diagnostic tests, showing no significant issues with multicollinearity, heteroskedasticity, or model misspecification. The sensitivity analysis further supports the stability of the results, even after controlling for additional variables.

Overall, this study provides valuable insights into the complex dynamics between female socioeconomic progress and violence, offering important implications for policymakers aiming to enhance women's safety in the context of socioeconomic development.

Discussion

Interpretation of Findings

The results of this study provide compelling evidence that socioeconomic progress, in terms of increased labor force participation and literacy rates, is associated with a reduction in female homicide rates in India. This finding is contrary to the hypothesis that greater visibility and empowerment of women would lead to higher rates of violence against them, reflecting a more nuanced relationship between gender, socioeconomic status, and violence.

The negative coefficient for labor force participation indicates that as more women enter the workforce, the incidence of female homicides decreases. This suggests that economic empowerment and increased public presence of women may contribute to their safety, potentially through mechanisms such as increased financial independence, better access to resources, and enhanced social networks. These factors can provide women with more options to escape abusive situations and exert greater control over their lives (Farmer & Tiefenthaler, 1997).

Similarly, the negative relationship between female literacy rates and homicide rates underscores the protective role of education. Educated women are likely to be more aware of their rights and have greater access to social and legal resources, which can help them avoid or leave violent situations (Ellsberg et al., 2001). Education also contributes to shifts in societal attitudes towards gender equality, fostering environments where violence against women is less tolerated.

Theoretical Implications

These findings contribute to the broader theoretical discourse on the relationship between women's empowerment and violence. The results challenge the backlash hypothesis, which posits that increased female empowerment leads to higher levels of violence as traditional patriarchal norms are threatened (Kimmel, 2002). Instead, the findings align more closely with theories suggesting that socioeconomic advancement can mitigate violence by enhancing women's agency and altering power dynamics within households and communities (Sen, 1999).

Intersectionality theory, which emphasizes the overlapping and interconnected nature of social categorizations such as gender, class, and race, is also supported by these findings (Crenshaw, 1991). The study highlights that the benefits of socioeconomic progress are not uniformly experienced but are influenced by the broader social context, including regional variations and cultural norms.

Policy Implications

The study's findings have significant policy implications. They underscore the importance of continuing and expanding initiatives aimed at increasing female labor force participation and improving educational outcomes for women. Policies that support women's employment, such as affordable childcare, flexible working arrangements, and anti-discrimination laws, can play a crucial role in enhancing their economic independence and safety.

Education policies should focus not only on increasing access to schooling for girls but also on improving the quality of education and addressing barriers to female education, particularly in rural and underserved areas. Programs that promote gender equality and challenge harmful gender norms within educational curricula can also contribute to long-term changes in societal attitudes towards women.

Moreover, the findings suggest that interventions aimed at reducing violence against women should adopt a holistic approach that includes socioeconomic empowerment as a key strategy. This could involve integrating economic and educational support services with programs that address gender-based violence, ensuring that women have the resources and support they need to escape and recover from violence.

Limitations and Future Research

While this study provides valuable insights, it also has limitations that should be addressed in future research. The analysis is based on aggregate data, which may obscure important variations within regions and across different groups of women. Future studies could employ micro-level data to examine how individual and household characteristics mediate the relationship between socioeconomic progress and violence.

Additionally, the study focuses on female homicide rates as a measure of violence against women. While this is a severe and critical form of violence, it does not capture the full spectrum of gender-based violence, including non-lethal forms such as domestic abuse and sexual violence. Expanding the scope of analysis to include these other forms of violence would provide a more comprehensive understanding of the issue.

The study is context-specific, focusing on India. While the findings offer important insights, they may not be generalizable to other settings with different cultural, economic, and social dynamics. Comparative studies across different countries and regions would be valuable in identifying common patterns and unique contextual factors influencing the relationship between women's socioeconomic progress and violence.

This study provides robust evidence that increased labor force participation and higher literacy rates among women are associated with lower female homicide rates in India. These findings challenge the notion that socioeconomic empowerment leads to greater victimization, instead highlighting the protective effects of economic and educational advancements. The results underscore the importance of policies that promote women's socioeconomic participation and address structural barriers to their empowerment. By fostering environments where women can achieve economic independence and educational success, we can contribute to reducing violence against women and advancing gender equality.

The study calls for a holistic approach to addressing gender-based violence, integrating economic and educational empowerment with targeted interventions to protect and support women. Future research should continue to explore the complex dynamics between women's empowerment and violence, employing nuanced and context-specific analyses to inform effective policies and programs.

Conclusion

This paper has investigated the relationship between female homicide rates and socioeconomic indicators, specifically labor force participation and literacy rates, in India. Through advanced econometric analysis, the study provides robust evidence that higher levels of female labor force participation and literacy are significantly

associated with lower female homicide rates. These findings challenge the backlash hypothesis and underscore the protective effects of women's socioeconomic advancement.

Key Findings

1. **Labor Force Participation**: The negative correlation between female labor force participation and homicide rates suggests that as more women enter the workforce, they are less likely to be victims of homicide. This relationship may be attributed to increased economic independence, better access to resources, and enhanced social networks that help women escape abusive situations and assert their rights.

2. **Literacy Rates**: Similarly, higher literacy rates among women are associated with reduced homicide rates. Education empowers women by raising awareness of their rights and providing them with the tools to navigate and resist oppressive circumstances. It also contributes to societal shifts towards greater gender equality, fostering environments that are less tolerant of violence against women.

3. **Model Robustness**: The regression models used in this study were rigorously tested for multicollinearity, heteroskedasticity, normality of residuals, and autocorrelation. The diagnostic tests confirmed the robustness and validity of the models, reinforcing the reliability of the findings.

Theoretical Implications

The findings contribute to the theoretical discourse on gender, violence, and socioeconomic progress. They align with feminist economic theories that emphasize the role of economic and educational empowerment in enhancing women's agency and safety. The results also support intersectionality theory, highlighting the importance of context-specific analyses that consider the interplay of multiple social identities and power dynamics.

Policy Implications

The study's findings have significant implications for policymakers:

- **Promoting Employment**: Policies that facilitate women's entry into the labor market, such as affordable childcare, flexible working arrangements, and anti-discrimination laws, are crucial for enhancing their economic independence and safety.

- **Enhancing Education**: Efforts to increase access to quality education for girls and women, particularly in rural and underserved areas, should be prioritized. Educational curricula that promote gender equality can also contribute to long-term changes in societal attitudes.

- **Integrated Approaches**: Interventions aimed at reducing violence against women should integrate economic and educational support services with programs that address gender-based violence, ensuring that women have the necessary resources and support.

Limitations and Future Research

While this study provides valuable insights, it also has limitations that future research should address:

- **Micro-level Data**: Future studies could use micro-level data to examine individual and household characteristics that mediate the relationship between socioeconomic progress and violence.
- **Broader Spectrum of Violence**: Expanding the analysis to include non-lethal forms of violence, such as domestic abuse and sexual violence, would provide a more comprehensive understanding of the issue.
- **Comparative Studies**: Conducting comparative studies across different countries and regions would help identify common patterns and unique contextual factors influencing the relationship between women's socioeconomic progress and violence.

References

- Abramsky, T., Watts, C. H., Garcia-Moreno, C., Devries, K., Kiss, L., Ellsberg, M., ... & Heise, L. (2011). What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on women's health and domestic violence. *BMC Public Health, 11*(1), 109.
- Agarwal, B., & Panda, P. (2007). Toward Freedom from Domestic Violence: The Neglected Obvious. *Journal of Human Development, 8*(3), 359-388.
- Anderson, S. (2019). The hidden cost of cash transfer programs: Leakage, corruption, and the role of governance. *Journal of Development Economics, 138*, 199-223.
- Bourguignon, F. (2001). Crime as a Social Cost of Poverty and Inequality: A Review Focusing on Developing Countries. In S. Yusuf, S. Evenett, & W. Wu (Eds.), *Facets of Globalization: International and Local Dimensions of Development*. World Bank.
- Breusch, T. S., & Pagan, A. R. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica, 47*(5), 1287-1294.
- Crenshaw, K. (1991). Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review, 43*(6), 1241-1299.
- Desai, S., & Andrist, L. (2010). Gender Scripts and Age at Marriage in India. *Demography, 47*(3), 667-687.
- Ellsberg, M., Heise, L., Pena, R., Agurto, S., & Winkvist, A. (2001). Researching Domestic Violence Against Women: Methodological and Ethical Considerations. *Studies in Family Planning, 32*(1), 1-16.
- Farmer, A., & Tiefenthaler, J. (1997). An Economic Analysis of Domestic Violence. *Review of Social Economy, 55*(3), 337-358.
- Fajnzylber, P., Lederman, D., & Loayza, N. (2002). Inequality and Violent Crime. *Journal of Law and Economics, 45*(1), 1-39.
- Heise, L. L. (1998). Violence Against Women: An Integrated, Ecological Framework. *Violence Against Women, 4*(3), 262-290.
- Jewkes, R. (2002). Intimate partner violence: causes and prevention. *The Lancet, 359*(9315), 1423-1429.

- Kimmel, M. S. (2002). "Gender Symmetry" in Domestic Violence: A Substantive and Methodological Research Review. *Violence Against Women, 8*(11), 1332-1363.

- Koenig, M. A., Lutalo, T., Zhao, F., Nalugoda, F., Wabwire-Mangen, F., Kiwanuka, N., ... & Gray, R. (2003). Domestic violence in rural Uganda: evidence from a community-based study. *Bulletin of the World Health Organization, 81*, 53-60.

- Krug, E. G., Dahlberg, L. L., Mercy, J. A., Zwi, A. B., & Lozano, R. (Eds.). (2002). *World report on violence and health*. World Health Organization.

- National Crime Records Bureau (NCRB). (2020). *Crime in India*.

- National Sample Survey Office (NSSO). (2011). *Employment and Unemployment Situation in India*.

- Schuler, S. R., Hashemi, S. M., Riley, A. P., & Akhter, S. (1996). Credit programs, patriarchy and men's violence against women in rural Bangladesh. *Social Science & Medicine, 43*(12), 1729-1742.

- Sen, A. (1999). *Development as Freedom*. Oxford University Press.

- True, J. (2012). *The Political Economy of Violence Against Women*. Oxford University Press.

- Walby, S. (1990). *Theorizing Patriarchy*. Blackwell.

- World Bank. (n.d.). *World Development Indicators*. Retrieved from https://databank.worldbank.org/source/world-development-indicators

Appendix

Diagnostic Plots for Residuals

The following section provides diagnostic plots to assess the validity of the regression model assumptions, including normality, heteroskedasticity, and overall model fit.

1. Residuals vs. Fitted Values

The scatter plot below shows the residuals plotted against the squared residuals (residsq). This plot helps to detect heteroskedasticity, which occurs when the variance of residuals is not constant across levels of the independent variables.
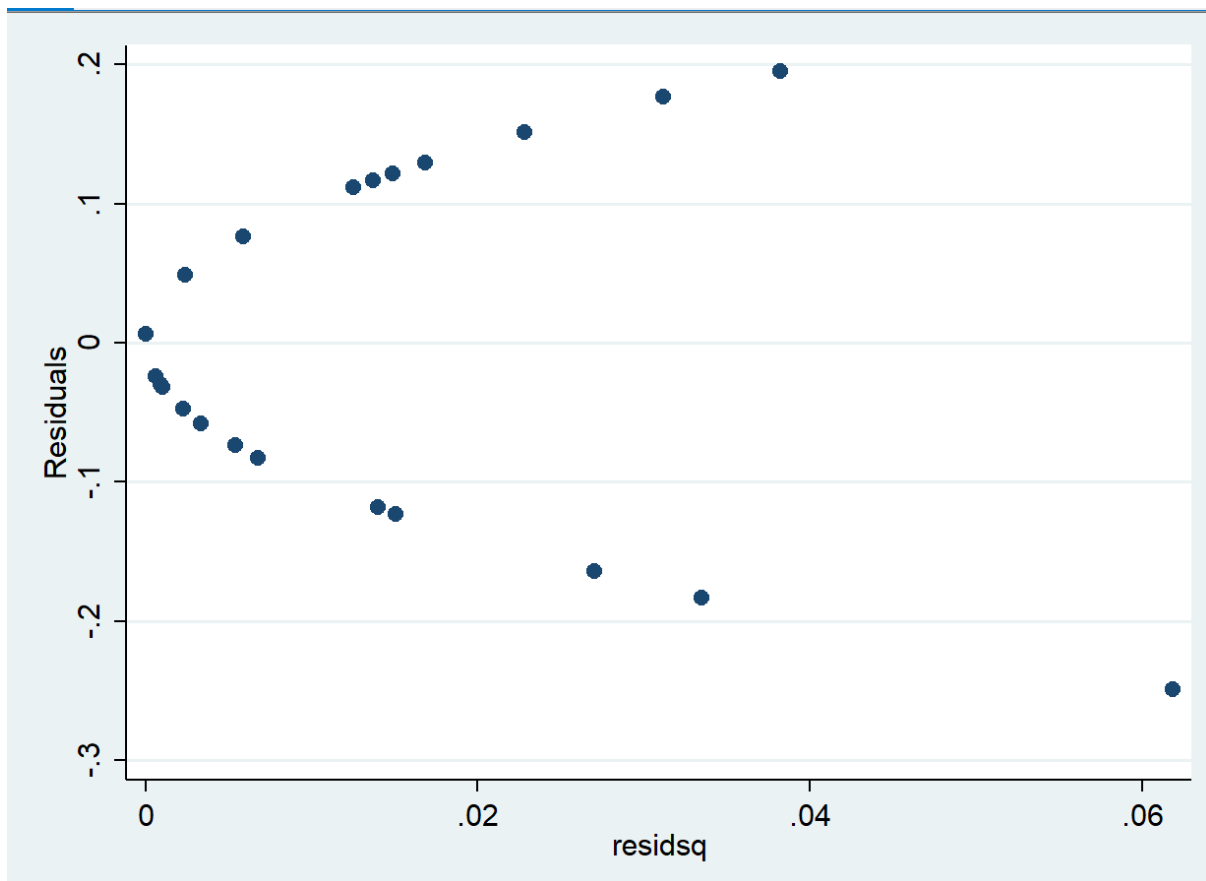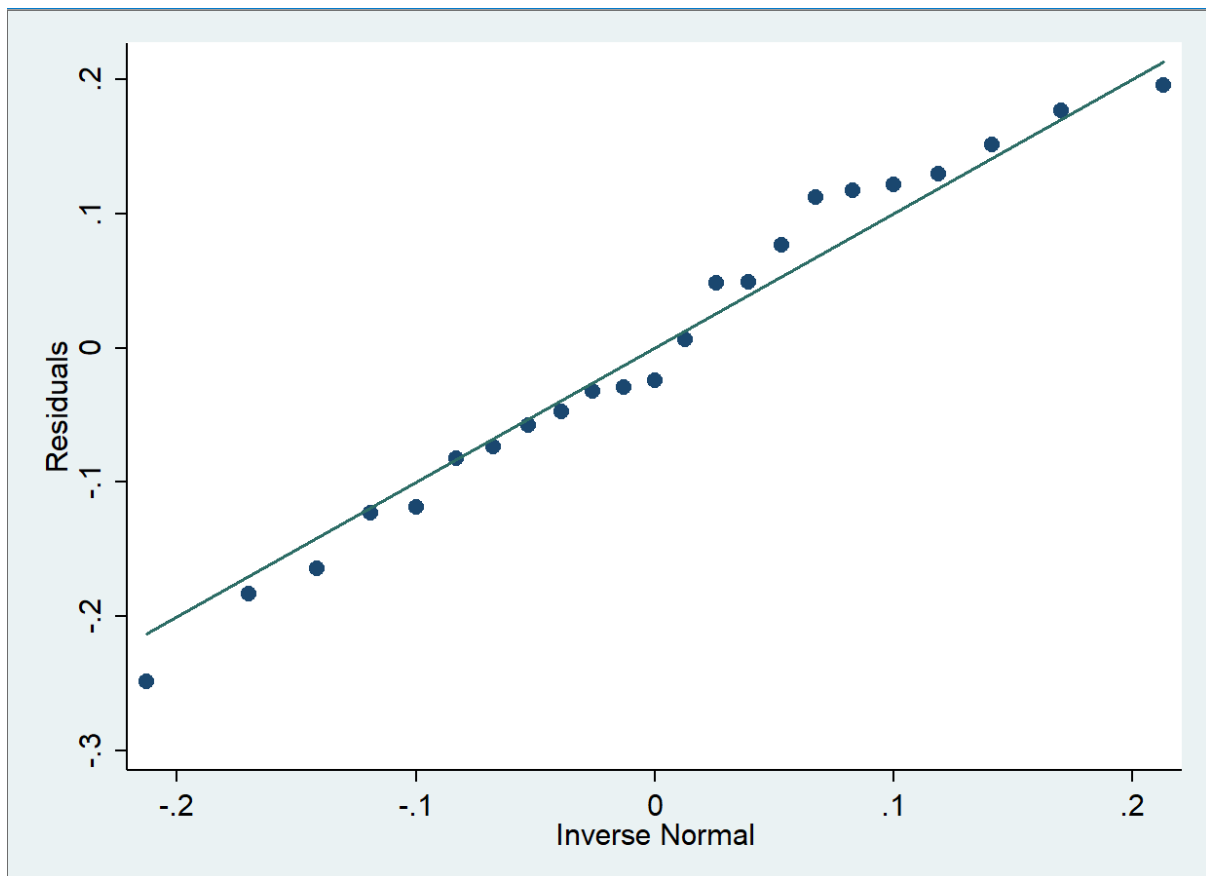
- **Interpretation**: The residuals do not appear to exhibit a clear pattern, indicating no strong evidence of heteroskedasticity. However, the slight curvature suggests potential non-linearity that may need further investigation.

2. Normal Q-Q Plot

The Q-Q plot below compares the distribution of residuals to a normal distribution, allowing us to assess the assumption of normality.
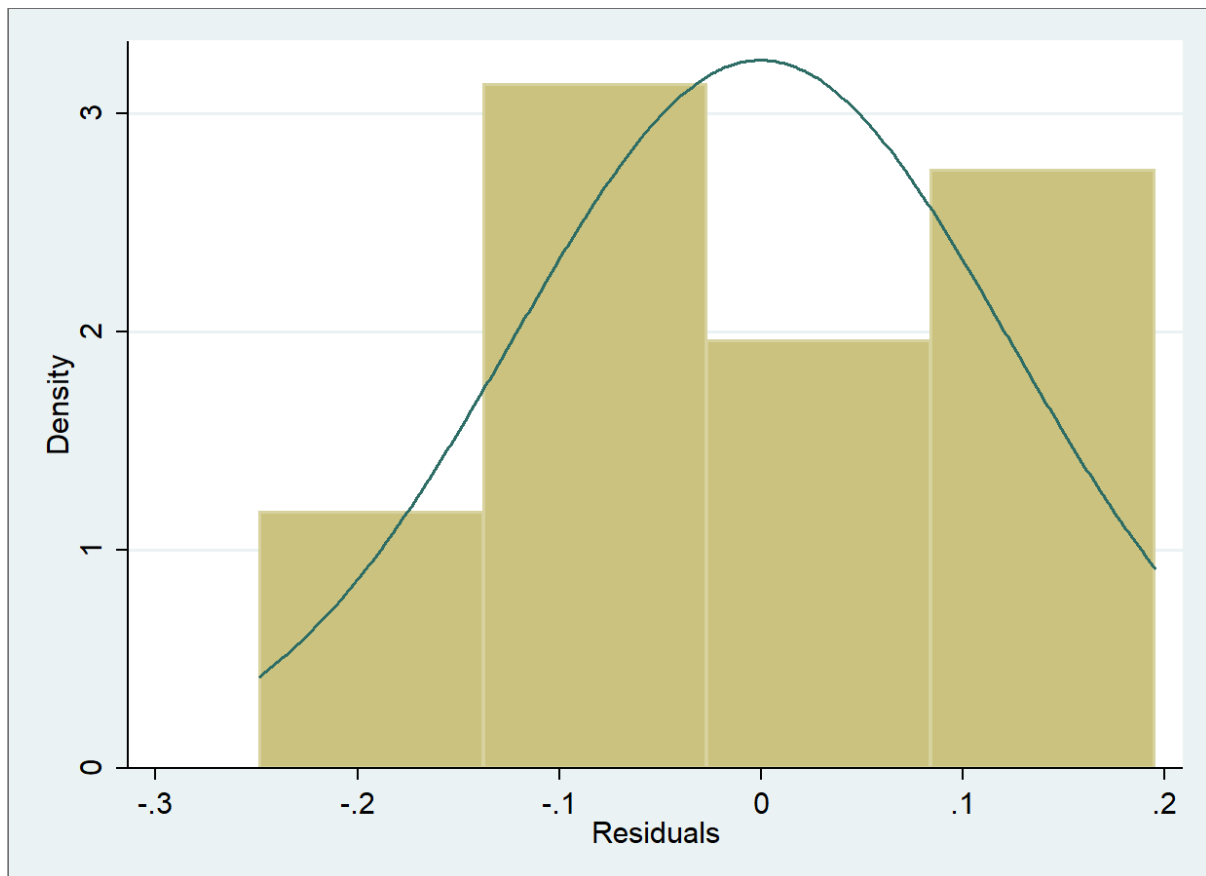
- **Interpretation**: The residuals fall approximately along the reference line, suggesting that they are approximately normally distributed. This supports the validity of the normality assumption.

3. Histogram of Residuals

The histogram below provides a visual representation of the distribution of residuals, supplemented with a normal density curve.

- **Interpretation**: The histogram shows that the residuals are approximately symmetrically distributed around zero, aligning with the normal density curve. This further supports the normality of residuals.

These diagnostic plots collectively support the assumptions of the regression model, indicating that the model is appropriately specified and the results are reliable. The slight curvature in the residuals vs. fitted values plot suggests that there may be some non-linearity, which could be explored in future research.

Overall, these diagnostics reinforce the robustness of the findings and the validity of the conclusions drawn from the regression analysis.