Intimate Partner Violence and Labour Market Outcomes in Tanzania

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Abstract
This paper takes data from the Tanzania National Panel Survey (TNPS) (2008-2009), fits them to the probit model to examine factors driving the probability of women to experience IPV (Intimate Partner Violence) and uses the propensity score matching to estimate the effect of IPV on women's probability of employment and earnings. The results show that the levels of IPV in Tanzania are still alarmingly high, relative to the levels in the developed countries. It is found that IPV is exacerbated by some male characteristics, including alcohol abuse, young age, polygamy, cohabitation, among others, with violence being higher in the rural areas than in the urban areas. In addition, low property ownership for women is found to contribute to the problem. A majority of women accept to live by the oppressing traditional norms, which they are using to justify IPV. The study finds IPV to be a catalyst to self-employment for women, which may enhance their bargaining. However, the negative side is that the business incomes from such self-employment ventures are likely to be depressed. In view of these findings, we still need to continue the fight against IPV.

Keywords: intimate partner violence; labour market outcomes; wage differentials; Tanzania

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1. Introduction

This paper analyses the association between intimate partner violence against women and access to labour opportunities in Tanzania. Domestic violence against women is a violation of the basic human rights (United Nations General Assembly, 1991). According to World Health Organization (WHO, 2013), about 35% of women have experienced violence against them in their lifetime, most of which is intimate partner violence (IPV). This violence against women is higher in developing countries than in developed countries (Garcia-Moreno et al. 2006). With 45.6% of women subject to lifetime IPV, Africa has recorded the highest levels of violence against women than where in the world.

Data on Tanzania show that 44% of ever-married women have experienced physical or sexual violence by their current/most recent partner, in their lifetime (TDHS, 2010). Domestic violence impinges immense social costs to society, which include the following. First is the economic costs, in terms of negative multiplier effects due to decreased female labour participation and reduced productivity at work. Second is the reduced quality of life and intergenerational transmission of violence. Third are the health effects such as injuries, depression, alcohol and drug abuse, resulting in increased mortality. Lastly are the resultant costs of treating or preventing domestic violence (Buvinic et al 1999; Aizer 2010; Aizer 2011). Women's access to labour market opportunities promise improvement in their lives. For instance, the World Development Report lists promoting women's access to economic opportunities as one of its top five policy priorities for promoting gender equality (World Bank, 2012). Women's access to labour market opportunities tends to decrease early marriage and childbearing (Heath, 2014). Additionally, empirical evidence shows that access to labour market opportunities improves women's bargaining power within a household (Anderson & Eswaran, 2009; Majlesi, 2012; Rahman & Rao, 2004).

On the negative side, job opportunities for women may have negative consequences if the work changes the existing relations within households and husbands respond with increased domestic violence. Theoretical household bargaining models show how a woman's access to economic opportunities can affect violence negatively or positively, depending on her initial level of bargaining power (Eswaran & Malhotra, 2011; Rao, 1997; Tauchen, Witte, & Long., 1991). A woman could face higher risk of domestic violence after beginning work as her husband seeks to offset the increased bargaining power that her income would otherwise bring her. Alternatively, an increase in bargaining power for a woman who already has high bargaining power can decrease domestic violence, since work opportunities increase the probability of fleeing from a bad marriage.

Violence against women may also affect a woman's economic well-being through its effect on her health. According to the human capital theory, an increase in an individual's stock of knowledge and 'good' personal attributes raise a woman's productivity in the market sector of the economy, where she produces money earnings, and in the nonmarket or household sector, where she produces commodities that are inclusive in her utility function (Grossman 2000). Because IPV affects a woman's health, it tends to lower her health capital, which is a component of women's human capital. Health capital determines the total amount of time available for market and nonmarket activities and the efficiency in undertaking those activities

(Grossman 1972). Thus, the human capital theory predicts that IPV consequently results in reduced women's productivity, causing lower earnings in the market sector, and low production of commodities, thereby reducing the individual's and household's utility.

In some situations, however, violence against women forces women to invoke some coping mechanisms for achieving a semblance of normal life. Such adjustment mechanisms entail finding labour opportunities, which affords them economic freedom from their husbands. The discussed pros and cons render the relationship between intimate partner violence against women and labour opportunities an empirical issue. Thus, we have used the data from the first wave of the Tanzania National Panel Survey (TNPS), collected in the period 2008-2009, to analyse the drivers for IPV towards women and the resulting effect on labour outcomes. Specifically, we firstly use the probit model to examine factors driving the probability of women to experience IPV; furthermore, we use the propensity score matching to estimate the effect of IPV on women's probability of employment and earnings.

The results show that IPV is mainly male driven, with some male characteristics significantly driving the problem. In addition, IPV was found to be a catalyst to self-employment for women, which may be a positive coping adjustment and may increase women's bargaining power. However, on the negative side, it was found that IPV tends to hamper productivity, which may reduce incomes from such self-employment ventures.

The paper is organised as follows: Section 2 presents a conceptual framework, which explains the links in the relationships analysed; Section 3 describes the data used; Section 4 provides the estimation strategy, presents the results and discussion; and Section 5 is the conclusion.

2. Conceptual Framework

In the literature, two models serve to explain the socio-economic determinants of women violence, which are, the Household Bargaining Model (HBM) and the Male Backlash Model (MBM). In Household Bargaining Model, women's risk to suffer violence is conceptualized as a function of their relative bargaining power within the household. The woman's actual and potential economic opportunities outside the home and the accompanying resources improve her bargaining power and strengthen her fallback position. The fallback position is the level of utility that a woman would derive outside the union should bargaining break down. In the cooperative bargaining framework (McElroy and Horney 1981; McElroy 1990), the fallback position is explained by several factors, which include market wage rate, nonwage income, inherited wealth, education, property rights assignment and legal structure of marriage. On the other hand, in the non-cooperative framework where there is no mutual agreement in the household, divorce may not be the best option. Instead, each individual retreats to pursue his or her own best interest, keeping interaction with the partner at the minimum (Lundberg and Pollak 1993).

Empirical evidence with regard to HBM include Panda and Agarwal (2005) who found that women who owned land or a house had a statistically significantly lower odds ratio of marital violence than women who do not own any property; Aizer (2011), who found that the decline in the male-female wage gap explains the reduction in violence against women. Additionally,

women's bargaining power also provides them with an opportunity to influence crucial decisions in the households. In this regard, Doss (2006) found that land ownership by women significantly increased budget shares on food.

The Male Backlash Model (MDM) (Engle Merry, 2009; Macmillan and Gartner, 1999), posits that as the women's economic power and prospects increases relative to that of men, the chances of experiencing violence against them increases because men feel their traditional gender role threatened. A woman's greater economic potential is viewed as the challenge to culturally perceived norm of male dominance and female dependence. Men may use violence as a tactic to reinstate their authority over their partners if this sign of dominance lacks or to prevent their partners from gaining the economic power (Macmillan and Gartner 1999; Anderberg and Rainer, 2011). Women face several constraints governed by social norms that determine what should be bargained and how the bargaining should be conducted.

Limited empirical evidence on Tanzania that could be found in support of HBM is Vyas et al (2015) who found that for a woman, being employed in the informal sector did not reduce her risk of experiencing violence; however, it reduced one major trigger for violence: that of negotiating money from men. As for MDM, Krishnan et al (2012) showed that the proximate determinants of women's experience of IPV in Tanzania included attitude towards violence and opinions about sexual decision-making and power relationship. This paper is has attempted to add to the arguably scanty empirical evidence on IPV in Tanzania.

3. Data and Summary statistics

The paper used data from the first wave of the Tanzania National Panel Survey (TNPS), which was collected in the period 2008-2009. This wave contains information on self-reported experience of intimate partner violence by women aged 15-50 years. For this panel data in Tanzania, the violence data was collected in the first wave only, which limits the findings to that static situation. The violence questions are a subset of the Conflict Tactics Scale developed by the World Health Organization. These questions are summarized in Appendix 1.

To each of the violent incident in Appendix 1, a woman would respond either YES or NO. If a respondent reported that she had ever experienced any of these acts, she was then asked if it had happened in the past 12 months. Thus, in this paper, a woman is considered to have experienced violence if she responded YES to at least one of the eight violent incidents. A class of binary measures of IPV was constructed in the following way:

- "IPV in Lifetime" - if a respondent reported to have ever experienced at least one of the violent incidents.
- "Current IPV" - if at least one the violent incident was experienced in the past 12 months before the survey.

The measure of violence from individual survey data may suffer from self-reporting bias. However, the interview process worked to minimize this risk by making the interview private, ensuring that no other man or woman was present in the same interview room at the same time. The interviewees were ensured of the confidentiality of their responses in that no one would learn about their answers; and no one would ever talk to their husbands, boyfriends or parents

about what they said in the interview. This included the assurance that her responses would not incriminate anyone. The fact that the interviewer was a government agent unknown to them and not from their community enhanced the confidentiality.

As for the labour questions, the household's main respondent was initially asked about each household member's main occupation in the past 12 months. The survey then collected detailed information on labour supply from all household members aged above 12 years. Participating household members were initially asked:

a) Did [household member] do any work of any type for pay, profit, barter, or home use during the last seven days? If the respondents answered *No* then the respondent was asked
b) Did you have a job or own farm enterprise at which you did not work during the last seven days and to which you will definitely return to work?

A YES response to either question was classified as "currently working" and a NO response to both questions was classified as "not working/unemployed." Working respondents were then asked a series of questions whether the work they did was waged and if so their earnings, and second, whether they were involved in business or self-employed activity (other than agriculture) and if so, the net profit from this business. The questions on labour and self-employment are summarized in Appendix 2.

The summary statistics are presented in Tables 1 and 2. Table 1 presents the statistics for the whole final sample, which consists of 1,781 currently partnered women who live with men in the same household as partners. Both partners were interviewed, and the woman responded to questions on violence, among others[1].

[1] The initial sample consisted of 3616 women who responded to the violence questions. Those who were not partnered, and those whose partner was not living in the same household or was not interviewed, were dropped.

Table 1: Summary statistics

	Obs	Mean	Std. Dev.	Min	Max
Wages	207	1,265,481	2,299,705	0	2.20E+07
Business Income	395	6,652,036	3.11E+07	0	5.18E+08
Out of labour force	1,779	0.2406	0.4276	0	1
Wage employment	1,779	0.1164	0.3207	0	1
Self-employment	1,779	0.2220	0.4157	0	1
Lifetime IPV	1,771	0.2874	0.4527	0	1
Current IPV	1,771	0.1671	0.3732	0	1
Justify Violence	1,771	0.5974	0.4906	0	1
Age	1,781	32.954	8.5531	15	75
Years of schooling	1,781	5.4885	3.4676	0	18
Own land	1,771	0.2580	0.4377	0	1
Monogamy	1,781	0.1173	0.3219	0	1
Polygamy	1,781	0.1325	0.3391	0	1
Male age	1,781	40.844	11.262	18	87
Male years of schooling	1,781	6.3739	3.4687	0	18
Male takes alcohol	1,781	0.1263	0.3323	0	1
Woman older than a man	1,781	0.0331	0.1790	0	1
Woman more educated than a man	1,781	0.1864	0.3895	0	1
Same occupation	1,781	0.6277	0.4835	0	1
Highest education	1,781	7.7669	2.7973	0	18
Household size	1,781	5.7243	3.0157	2	46
Log expnd. per capita	1,781	13.211	0.6667	11.419	15.689
Location (Urban=1)	1,781	0.3442	0.4752	0	1

In Table 1, 28.7% of women were found to have experienced IPV in their lifetime and about 16.7% of women experienced violence in the 12 months prior to the survey (current IPV). These figures are very high relative to those in the developed countries. For example, Aizer (2010) found that only 2% of women in the US are subjected to IPV annually. Furthermore, the descriptive statistics show that females were younger and less educated than their male partners. About a quarter of the women (most of them in the rural areas) own land. A majority of women, notably 60%, accept that a man is justified to beat his wife under certain circumstances[2].

[2] These circumstances include the following: she goes out without telling him; she neglects the children; she argues with him; she refuses to have sex with him; there are problems with his or her family; there are money problems; there is no food at home; and such other reasons.

Table 2 compares a few summary statistics for these women between rural and urban areas, whereby 1168 are from the rural areas and 613 are from the urban areas.

Table 2: IPV in Rural and Urban areas

Variable	[1]	[2]	[3]	[4]
	Mean			Difference
	ALL	RURAL	URBAN	Rural -Urban
IPV in Lifetime	0.287	0.33	0.21	0.12***
Current IPV	0.167	0.18	0.13	0.05***
Justify violence	0.597	0.63	0.53	0.10***
Observations	1781	1168	613	

The categorization between the rural and urban areas in Table 2 shows that the levels of violence were higher in the rural areas than in the urban areas; specifically, 33% of women in the rural areas were found to have experienced IPV in their lifetime, compared to 21% in the urban areas. For current IPV, it was 18% compared to 13%, respectively. Furthermore, the summary statistics show that women in rural areas justify violence acts against them as compared to women in urban areas. This may partly explain the higher rates of IPV in rural areas compared to urban areas, as women have been tuned to accept the violent acts as normal and justifiable.

4. Empirical Estimation Models and Results

This section describes the estimation models used for each objective of the study, presents and discusses the results. The section also provides a discussion of the limitations of the used models and proposes a mechanism for addressing these limitations.

4.1 Analysis of the factors driving intimate partner violence (IPV)

The probit model was used to examine the factors that drive IPV episodes (for both the violence ever experienced (lifetime violence) and the violence experienced in the previous year (current violence). A probit model on the factors determining IPV is given as:

$$IPV_i = 1[F_i\alpha + M_i\beta + H_i\delta + \varepsilon_i > 0] \quad (1)$$

IPV_i is a binary indicator equal to one if a woman i has experienced IPV and zero otherwise. Other variables and parameters are defined as follows: F_i is a vector of woman i 's characteristics; M_i is a vector of the characteristics of the male partner of woman i; H_i is a vector of household characteristics a woman i belongs to; $\alpha, \beta \; and \; \delta$ are vectors of parameters to be estimated and ε_i is the error term, which is assumed to be normally distributed. The marginal effects from the probit estimates of the factors determining IPV against women are reported in Table 3.

Table 3: Marginal Effects of Factors Associated with IPV in Tanzania

VARIABLES	[1] Lifetime IPV	[2] Current IPV
Woman's Characteristics		
Age	0.00319*	-0.000463
	[0.00168]	[0.00150]
Years of schooling	0.00883*	0.00498
	[0.00455]	[0.00431]
Owns land	0.0337	0.0296
	[0.0362]	[0.0309]
Male partner's characteristics		
Male age	-0.00568***	-0.00419***
	[0.00149]	[0.00102]
Male years of schooling	0.00436	0.00171
	[0.00575]	[0.00612]
Male takes alcohol	0.132***	0.0934***
	[0.0361]	[0.0213]
Relative power variables		
Polygamy	0.141***	0.0370
	[0.0429]	[0.0290]
Cohabiting	0.0877**	0.0830***
	[0.0372]	[0.0241]
Woman older than a man	0.0157	0.0179
	[0.0509]	[0.0359]
Woman more educated than a man	-0.0484	-0.00415
	[0.0430]	[0.0435]
Same occupation	-0.00586	-0.0117
	[0.0369]	[0.0221]
Household Characteristics		
Years of schooling of hhd member with highest education	-0.0221***	-0.0154**
	[0.00816]	[0.00689]
Household size	-0.00225	-0.00105
	[0.00440]	[0.00405]
Log expend. per capita	0.00123	-0.0230
	[0.0288]	[0.0249]
Location (urban=1)	-0.0906**	-0.0203
	[0.0437]	[0.0293]
Constant	0.00319*	-0.000463
	[0.00168]	[0.00150]
Observations	1,771	1,771

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

The empirical results summarized in Table 3 suggest that IPV is mainly associated by male characteristics. IPV is significantly, correlated negatively with age of the male partner. The younger the male partner is, the higher the probability that the female partner will experience IPV. The study also finds that men who take alcohol are associated with more likelihood to abuse their female partners. The probability for women with male partners who take alcohol to experience violence in their lifetime and in the current period was found to be higher by 13.2% and 9.3% percent, respectively.

Polygamy and cohabiting were found to be positively associated with a woman's likelihood of experiencing IPV. Being in a polygamy relationship increases the probability of a woman experiencing lifetime violence by 14.1 percent compared to being in a monogamy relationship. Women in cohabitation are more likely to experience lifetime violence and violence within 12 months by 8.8 and 8.3 percent more probability compared to those in monogamy marriages at least once in a lifetime. The education of the highly educated member of the household is also negatively correlated with episodes of IPV in a household. Living in urban areas is negatively associated with IPV.

4.2 Effect on Intimate Partner Violence labour outcomes

This section presents the analysis of the effect of women's experience of IPV on labour outcomes. The paper analyses three cases of employment status, measured in binary form, which are the following: being out of labour force; having wage employment and being self-employed. These three cases are not exhaustive of all the possible employment statuses; for example, employment in agriculture and family helpers are not included. These cases are also not mutually exclusive. For example, one can have a wage employment while at the same time may be engaged in other income generating activities classified as self-employment. Therefore, the best approach taken for estimation was to analyses each outcome variable in isolation using binary response models. A probit model was used to estimate the effect of IPV on the probability of employment as given below:

$$L_i = 1[\gamma IPV_i + F_i\alpha + M_i\beta + H_i\delta + \varepsilon_i > 0] \quad (2)$$

Where, L_i is a binary measure of employment status. Other variables are as follows: IPV_i is a binary indicator equal to one if a woman has experienced IPV and zero otherwise. F_i is a vector of woman i's characteristics. M_i is a vector of the characteristics of the male partner of woman i. H_i is a vector of household characteristics to which woman i belongs; $\alpha, \beta \; and \; \delta$ are vectors of parameters to be estimated and ε_i is the error term, which is assumed to be normally distributed. Table 4 presents the marginal effects from the estimation the probit model in Equation 2, which shows the effect of IPV on employment status.

Table 4: Marginal Effects of the Probit Estimation of the Effect of IPV on Employment Status

VARIABLES	[1] Out of labour	[2] Out of labour	[3] Wage employmen	[4] Wage employmen	[5] Self-employmen	[6] Self-employmen
Lifetime IPV	-0.0146		0.0181		0.0965***	
	[0.0253]		[0.0168]		[0.0274]	
Current IPV		-0.00942		0.0287		0.0813***
		[0.0340]		[0.0190]		[0.0259]
Justify violence	0.00972	0.00869	-0.0191	-0.0192	0.00668	0.0129
	[0.0214]	[0.0225]	[0.0159]	[0.0151]	[0.0258]	[0.0253]
Age	-0.00317	-0.00321	0.000843	0.000909	0.00606***	0.00641***
	[0.00204]	[0.00202]	[0.00149]	[0.00146]	[0.00211]	[0.00219]
Years of schooling	-0.00187	-0.00195	0.00792***	0.00796***	0.00692**	0.00749**
	[0.00580]	[0.00581]	[0.00296]	[0.00301]	[0.00333]	[0.00333]
Owns land	-0.00894	-0.00957	0.0267	0.0265	0.0295	0.0295
	[0.0347]	[0.0348]	[0.0214]	[0.0214]	[0.0288]	[0.0293]
Polygamy	-0.000528	-0.00212	0.00347	0.00518	-0.0220	-0.0119
	[0.0309]	[0.0304]	[0.0239]	[0.0237]	[0.0328]	[0.0340]
Cohabiting	-0.0472*	-0.0478*	0.0481*	0.0467*	0.0580	0.0583
	[0.0256]	[0.0257]	[0.0254]	[0.0255]	[0.0430]	[0.0418]
Male age	0.000376	0.000420	5.52e-05	5.87e-05	-	-
	[0.00120]	[0.00121]	[0.00131]	[0.00130]	[0.00126]	[0.00126]
Male years of schooling	0.00206	0.00206	0.00245	0.00249	0.00275	0.00298
	[0.00724]	[0.00730]	[0.00464]	[0.00464]	[0.00897]	[0.00895]
Male takes alcohol	-0.0879***	-0.0891***	0.0470*	0.0469*	0.0380	0.0436**
	[0.0218]	[0.0222]	[0.0275]	[0.0277]	[0.0234]	[0.0220]
Woman older than a man	-0.0407	-0.0407	0.0610	0.0609	-0.0396	-0.0386
	[0.0459]	[0.0457]	[0.0383]	[0.0381]	[0.0490]	[0.0501]
Woman more educated than a man	-0.0135	-0.0127	0.0260	0.0253	0.0271	0.0227
	[0.0400]	[0.0400]	[0.0214]	[0.0218]	[0.0395]	[0.0391]
Same occupation	-0.264***	-0.264***	0.0724***	0.0730***	0.121**	0.121**
	[0.0338]	[0.0340]	[0.0275]	[0.0277]	[0.0492]	[0.0502]
Highest education	-0.00363	-0.00354	0.00285	0.00283	-0.00628	-0.00705
	[0.00603]	[0.00603]	[0.00588]	[0.00599]	[0.00976]	[0.00993]
Household size	-0.0113*	-0.0112*	-0.00420	-0.00411	-0.000212	-0.000215
	[0.00594]	[0.00590]	[0.00355]	[0.00354]	[0.00372]	[0.00366]
Log expnd. per capita	-0.0407**	-0.0409**	-0.0189	-0.0181	0.0534***	0.0559***
	[0.0196]	[0.0193]	[0.0189]	[0.0187]	[0.0183]	[0.0181]
Location (urban=1)	0.203***	0.204***	-0.00380	-0.00460	0.202***	0.193***
	[0.0294]	[0.0293]	[0.0270]	[0.0267]	[0.0487]	[0.0501]
Observations	1,771	1,771	1,771	1,771	1,771	1,771

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

The results in Table 4 show that on the effect of a woman who has suffered IPV either in her lifetime or in the current period is more likely to pursue self-employment than one who has not. This result has an intuitive appeal. Women experiencing violence will seek to get their own financial freedom to reduce some of the frictions that lead to violence. Whereas obtaining a wage employment may take long and needs attainment of some requirements, self-employment may be a relatively easier way to pursue.

The paper goes further as to analyse the effect of IPV on earnings for those employed. The study uses Ordinary least square method (OLS) to estimate that relationship, where the outcome variable is the total annual wage or the total annual earnings from self-employment. The obtained results are presented in Table 5.

Table 5: The marginal effect of IPV on earnings from OLS estimation

VARIABLES	[1] Wage	[2] Wage	[3] Self-empl. earnings	[4] Self-empl. earnings
Lifetime IPV	0.0409		-0.529*	
	[0.182]		[0.299]	
Current IPV		0.158		-0.0242
		[0.156]		[0.303]
Justify violence	-0.137	-0.146	-0.136	-0.198
	[0.141]	[0.133]	[0.177]	[0.182]
Age	-0.00202	-0.00167	0.0383	0.0363
	[0.0126]	[0.0124]	[0.0287]	[0.0292]
Years of schooling	0.0375*	0.0379*	0.0837*	0.0766
	[0.0191]	[0.0204]	[0.0455]	[0.0460]
Owns land	-0.0562	-0.0634	-0.160	-0.107
	[0.112]	[0.108]	[0.235]	[0.229]
Polygamy	-0.285	-0.275	0.314	0.289
	[0.189]	[0.195]	[0.316]	[0.309]
Cohabiting	0.126	0.112	-0.472	-0.471
	[0.125]	[0.130]	[0.288]	[0.277]
Male age	0.0114	0.0110	0.00998	0.0152
	[0.00834]	[0.00840]	[0.0210]	[0.0212]
Male years of schooling	-0.00831	-0.00724	0.137	0.139
	[0.0329]	[0.0320]	[0.107]	[0.104]
Male takes alcohol	0.139	0.144	0.669**	0.631*
	[0.149]	[0.154]	[0.318]	[0.323]
Woman older than a man	0.669*	0.672*	0.753	0.691
	[0.358]	[0.354]	[0.462]	[0.494]
Woman more educated than a man	-0.0828	-0.0738	-0.231	-0.206
	[0.233]	[0.243]	[0.410]	[0.418]
Same occupation	0.232	0.259	-0.149	-0.144
	[0.159]	[0.158]	[0.283]	[0.284]
Highest education	0.103*	0.103*	-0.0922	-0.0806
	[0.0538]	[0.0515]	[0.124]	[0.119]
Household size	0.0183	0.0211	0.0342	0.0375
	[0.0362]	[0.0362]	[0.0732]	[0.0709]
Location (urban=1)	0.357*	0.371**	0.591*	0.661*
	[0.174]	[0.178]	[0.333]	[0.328]
Observations	206	206	363	363
R-squared	0.347	0.350	0.161	0.150

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

The results in Table 5 indicate that IPV has no statistically significant association with wages, but has marginal significant association with earnings from self- employment. While IPV may be associated with higher probability of a woman getting into self-employment, it is negatively associated with women's earnings from self-employment. Thus, abused women in self-employment earn relatively lower than those not abused.

Since women were not randomly assigned to be under violent relationships, we potentially face a selection bias problem. Descriptive analysis and estimation for drivers of IPV reveals that women who have experienced IPV are characteristically different from those who have not. To control for self-selection bias, we apply the propensity score matching (PSM) method proposed by Rosenbaum and Rubin (1983) to estimate the causal effect of IPV on the labour market outcomes. Propensity score is defined as a conditional probability measure of treatment participation given the observable characteristics. For individuals with the same propensity score, the assignment to treatment is random; and it should look identical in terms of their observed covariates (Cameron and Trivedi, 2005). In this study, PSM balances the distribution of observed covariates between those who have experienced IPV (the treated group) and those who have not experienced IPV (the control group), based on their propensity score. The propensity score in this case corresponds to the conditional probability of experiencing IPV, given the pre-treatment observable characteristics. It is estimated using binary (probit or logit) model as follows:

$$p(x) = Pr(T_i = 1|X_i) = P(T_i^* > 0) = 1 - G(X\beta) \quad (3)$$

Where, T is the binary treatment variable; $T_i^*$is the latent variable for the treatment variable and $G(*)$ is the cumulative distribution function of the normal or logistic distribution, and X is the vector of individual's baseline characteristics.

Since the outcome variables are assumed to be independent of the assignment, given the baseline characteristics (X_i), they are independent of the assignment, given the propensity score, $p(x)$, as if assignment to treatment and control groups were random. The paper uses nearest neighbour (NN) matching as the matching algorithm. This technique matches a treated individual with the control-sample individual(s) who has the closest propensity score. Since we do not specifically have pre-treatment control variables, we use the variables which we assume that are not affected by the treatment, which is experiencing IPV. The individuals who are matched to the treated individuals become the comparison group and produce an estimate of the counterfactual. The simple difference in outcome variables between the treatment and the matched control individuals allows for the estimations of the average treatment effect for the treated (ATT) as follows:

$$ATT = \frac{1}{N_T}\sum_i \left(L_i - \frac{1}{N_{C,i}}\sum_{j\in(T=0)} L_j\right) \quad (4)$$

Where N_T is the number in the treated group (T = 1). $N_{C,i}$ is the number in the comparison group corresponding to the ith observation of the treated group. And j is an element of the set of matched comparison units obtained using nearest-neighbourhood matching set defined using

propensity score as $A_i(p(x)) = \{p_j | min_j \, ||p_i - p_j||\}$. L_i is the value of outcome variable for the treated individual and L_j is the outcome variable value for the comparison individual in the control group.

ATT is defined only in the region of common support where there is an overlap of the distributions of the propensity scores of the treatment and control groups. Therefore, we start by examining the distributions of the propensity scores for the treated and the control group before and after matching. Figures 1 and 2 show that there was a difference between the distributions for the treated and control group before matching for lifetime IPV and current IPV treatments, respectively. This implies a potential selection bias into violent relationships, which would also create bias in the estimated effects. Matching the propensity score using NN matching creates a good overlap thus reducing the assignment bias based on observable characteristics.

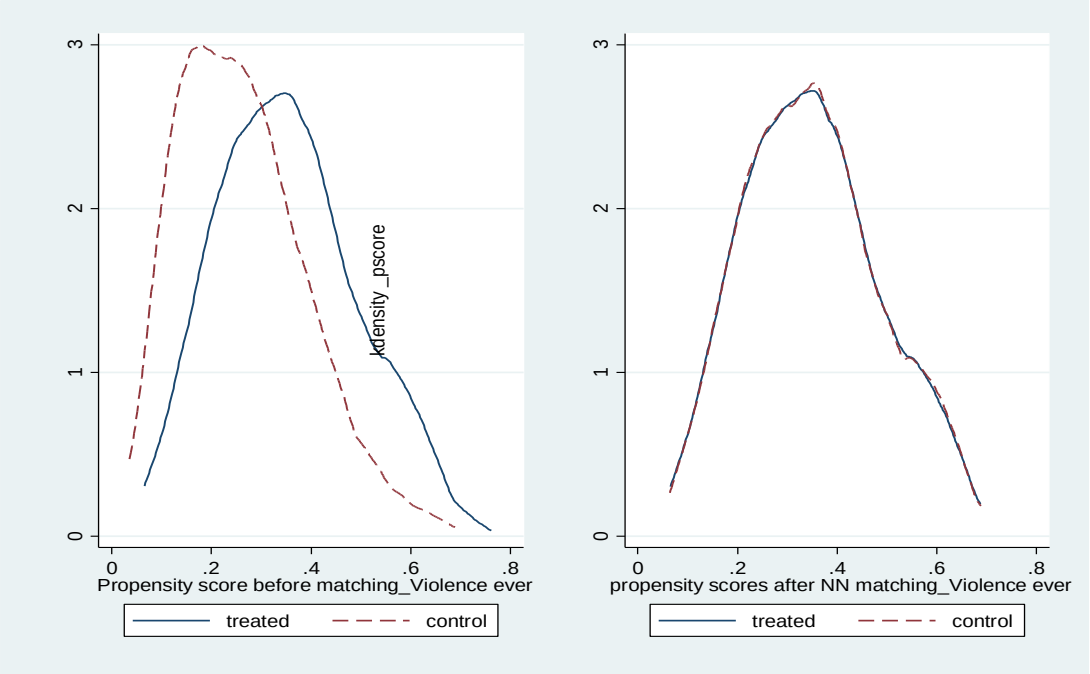

Fig 1: Propensity score before and after NN matching for treatment, lifetime IPV

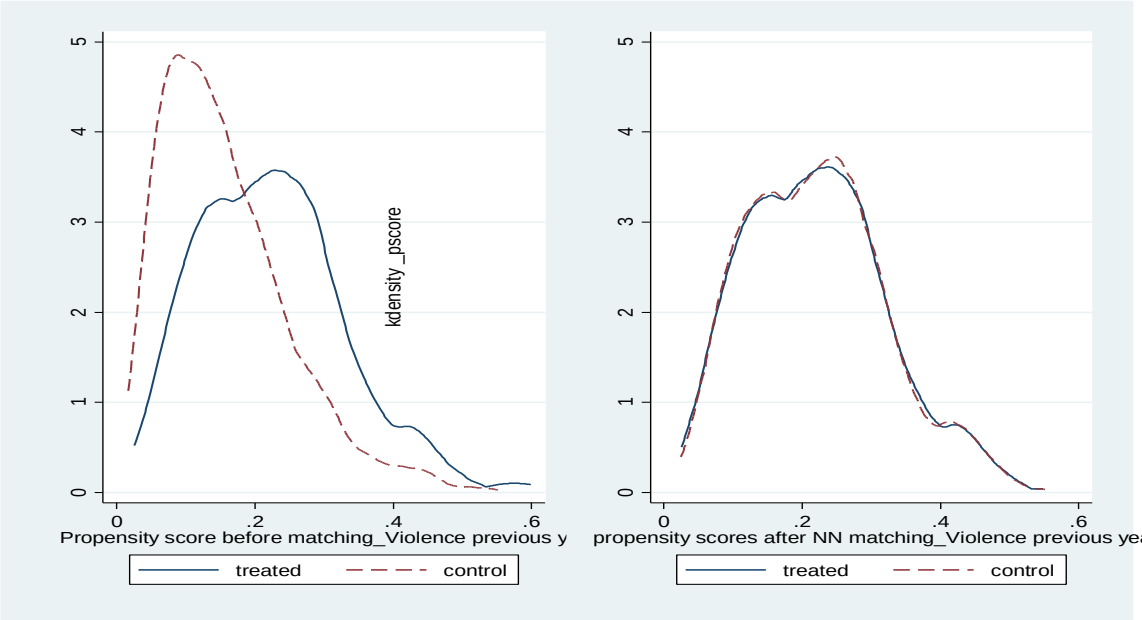

Fig 2: Propensity score before and after NN matching for treatment, current IPV

The results using the propensity score matching are summarized in Table 6. These results show that a woman who has experienced IPV both in her lifetime and in the current period (last 12 months) is less likely to be out of the labour force. Such a woman is more likely to be self-employed than the one who has not experienced IPV at least once in her lifetime or in the current period, which is similar to the findings from the probit models. This finding supports the HBM and complement Vyas et al (2015). In particular, avenue for self-employment may be a coping mechanism for adjustment against the utility-eroding IPV consequences, despite the negative effects on earnings.

Table 6: Effect of IPV on employment and earnings: Average Treatment effect on the Treated using propensity score matching technique

Treatment: Lifetime IPV						
Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Out of labour force	Unmatched	0.18	0.26	-0.08***	0.02	-3.54
	ATT	0.19	0.19	-0.00	0.03	-0.02
Wage employment	Unmatched	0.13	0.11	0.02	0.02	1.39
	ATT	0.13	0.10	0.03	0.02	1.64
Self-employment	Unmatched	0.29	0.20	0.10***	0.02	4.37
	ATT	0.29	0.20	0.09***	0.03	3.22
Wage	Unmatched	1,083,029	1,354,738	-271,709	340,627	-0.80
	ATT	1,107,559	877,045	230,514	388,218	0.59
	Unmatched	5,929,880	7,084,744	-1,154,864	3,232,276	-0.36
Self-employment earnings	ATT	6,089,678	6,222,189	-132,512	4,319,172	-0.03
Current IPV						
Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Out of labour force	Unmatched	0.20	0.25	-0.05**	0.03	-1.99
	ATT	0.20	0.20	-0.00	0.03	-0.11
Wage employment	Unmatched	0.15	0.11	0.03*	0.02	1.67
	ATT	0.14	0.12	0.03	0.02	1.06
Self-employment	Unmatched	0.30	0.21	0.09 ***	0.03	3.37
	ATT	0.29	0.18	0.12***	0.03	3.63
Wage	Unmatched	1,121,186	1,303,315	-182,129	394,759	-0.46
	ATT	1,088,073	784,805	303,268	534,072	0.57
Self-employment	Unmatched	3,771,820	7,477,635	-3,705,814	3,755,870	-0.99
earnings	ATT	3,946,790	8,042,990	-4,096,199	3,815,495	-1.07

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

5. Conclusion

This study was motivated by high levels of domestic violence in Tanzania, that 44% of ever-married women have experienced physical or sexual violence by their current/most recent partner in their lifetime, which spells immense social costs. In addition, the study surmised from the literature that the relationship between intimate partner violence against women and labour opportunities, for example, is an empirical issue. Yet, empirical studies on Tanzania that have addressed the IPV problem are still scanty.

Thus, as an attempt to fill the empirical gap, this paper has analysed the relationships between intimate partner violence and labour market outcomes in Tanzania. Using the data from the first wave of the Tanzania National Panel Survey (TNPS) (2008-2009), the paper used firstly the probit model to examine factors driving the probability of women to experience IPV; and secondly, it used the propensity score matching to estimate the effect of IPV on women's probability of employment and earnings.

It has been found that the levels of IPV in Tanzania are still alarmingly high. For example, 28.7% of women were found to have experienced lifetime IPV and about 16.7% of women to have experienced violence in the 12 months prior to the survey (current IPV). In comparison with developed countries the experienced IPV in Tanzania is relatively very high. The paper found that IPV is mainly male driven, with some male characteristics significantly driving the problem (alcohol abuse, young age, polygamy, cohabitation, among others). The violence was found to be higher in the rural areas than in the urban areas; for example, 33% of women in the rural areas were found to have experienced IPV in their lifetime, compared to 21% in the urban areas. The results have further showed that property ownership for women is still low and a majority of the women still accept to live by the oppressing traditional norms, which they use to justify IPV. For example, 60% of women in the survey accepted that a man is justified to beat his wife under certain (trivial) circumstances.

With regard to employment and earnings, the study found IPV to be a catalyst to self-employment for women, which may be a positive coping adjustment and may tilt the balance of power and enhance the bargaining, as posited by HBM. However, the results indicate also the negative side of IPV, which is that the business incomes from such self-employment ventures are likely to be depressed. In view of these findings, we still need, as a society, to raise alarm about the negative effects of IPV and continue taking measures for curbing it.

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Appendix 1: Questions on Violence against Women in TNPS – First Wave

Has your current partner or, any partner ever....	
a)	*Slapped you or thrown something at you that could hurt you?*
b)	*Pushed you or shoved you?*
c)	*Hit you with his fist or with something else that could hurt you?*
d)	*Kicked you, dragged you, or beaten you up?*
e)	*Choked or burnt you on purpose?*
f)	*Threatened to use or actually used a gun, knife, or other weapon against you?*
g)	*Physically force you to have sexual intercourse when you did not want to?*
h)	*Did you ever have sexual intercourse you did not want because you were afraid of what he might do?*

Appendix 2: Questions on Wage Work and Self Employment

Questions on Wage Work	
a)	*Did [household member] do any wage work during the last seven days?* If *No*
b)	*Did [household member] do any wage work during the last 12 months?*
c)	If a respondent reported *Yes* to either question he/she was asked the following: *How much was [household member] last payment* IF RESPONDENT HAS NOT YET BEEN PAID *what payment do you expect? What period of time did this payment cover [hour; day; week; fortnight; month; quarter year; half year; year]?*
d)	*Does [household member] receive any payment for this work in any other form (apart from salary)?* If *Yes, What is the value of those payments and over what time interval [hour; day; week; fortnight; month; quarter year; half year; year]?*
Questions on Self Employment	
e)	*Did you operate any business or do any self-employed activity during the last week, other than agriculture?* If *No*
f)	*Did you operate any business or do any self-employed activity during the last 12 months other than agriculture?*
g)	If a respondent reported *Yes* to one question he/she was asked: *What was your net income (profit) from your business or businesses last week/month?*