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Modeling Intimate Partner Violence with Home Production, Marriage Markets and Male Domination ¹

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ABSTRACT

The existing literature offers mixed evidence regarding the association between intimate partner violence and women's relative income and income opportunities: in some cases it is negative and in others positive. I present a conceptual framework that makes room for both kinds of associations and points out to other factors that possibly affect IPV (Intimate Partner Violence). It adds to Gary Becker's theory of marriage by introducing workers in household production and incorporating standard models from labor economics: competitive and monopsonistic labor markets. It is assumed that men may interfere with market equilibria due to their control of political, social and legal institutions. The new framework is comprehensive and able to account for many empirical findings, including the coexistence of positive and negative associations between IPV and women's labor force participation and reported associations between IPV and divorce.

1. Introduction

Intimate partner violence (IPV) is a serious problem that affects large segments of the world population: estimates of its prevalence range from 23% in high-income countries to 37% in the Eastern Mediterranean region and South-East Asia. Most intimate partner violence is perpetrated by men and aimed at women.² In recent years, a growing number of economists have written on

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² World Health Organization, Violence against women <https://www.who.int/news-room/fact-sheets/detail/violence-against-women>, 2017)

the topic of IPV, and in particular have provided evidence on how women's income opportunities outside the home—from work in the labor force or non-work transfers—affect the incidence of IPV. Some find that improved women's income opportunities outside the family are associated with reduced IPV. For instance, Aizer (2010) and Henke and Hsu (2020) found that in the USA when women's relative wages are higher less physical intimate partner violence is observed. Other studies have reported a positive association between IPV and women's income opportunities. Among others, Angelucci (2008) found that when Mexican women got relatively higher income transfers from the government IPV increased and Amaral et al (2015) reported that in India improved relative employment opportunities for poor women led to increased total gender-based violence, including kidnappings, sexual harassments and domestic violence. Hidrobo and Fernald (2013) found that in Ecuador cash transfers to mothers affected emotional violence from their partners in either direction, depending on their own and their partner's education. According to Heath (2014) in villages around Dhaka, Bangladesh, there was a positive correlation between women's work and domestic violence, but only among women with less education or who were younger at first marriage. Simple global comparisons indicate that countries with lower levels of IPV tend to have higher income and higher levels of women's labor force participation (WHO report 2013).

To explain their findings about IPV and women's relative income opportunities economists have relied on cooperative bargaining and non-cooperative models. Cooperative bargaining models explain why women's economic opportunities are negatively related to IPV by assuming that men have preferences for perpetrating intimate partner violence towards their female partners and modeling a bargaining process involving women "paying" men to get them to be less violent. The higher their relative earnings the more successful they are at convincing men in that direction (e.g. Tauchen et al. (1991), Farmer and Tiefenthaler (1997), Aizer (2010), Henke and Hsu 2018).³ Non-cooperative models have been called upon when the empirical analysis revealed a positive association between male abusive behavior and women's economic resources.⁴ Anderberg and Rainer (2013), the first non-cooperative economic model of intimate

³ Other cooperative bargaining models aimed at explaining individual consumption include McElroy and Horney (1981) and Bourguignon et al. (1993).

⁴ Non-cooperative bargaining models analyzing outcomes other than domestic violence include Lundberg and Pollak (1993), Konrad and Lommerud (1995), Chen and Woolley (2001), and Heath and Tan (2019).

partner abuse, models husbands as sabotaging their wives' labor force opportunities (not necessarily in violent ways) in order to obtain more household produced goods.⁵ This is instrumental abuse or violence, a strategy towards increasing personal well-being at the expense of that of the partner. Instrumental violence is also what drives husbands to be violent towards their wives in Bloch and Rao (2002), their goal being to obtain a higher dowry from their in-laws. The more potential financial gains men can extract from their wife (because she earns more or her family has more money) the more IPV is likely to be observed. The literature also includes cue-triggered models that take men's preferences for intimate partner violence as given and test whether these preferences vary with triggers such as alcohol consumption (Angelucci 2008), losses by a local football team (Card and Dahl 2011) or local temperatures (Henke and Hsu 2020). It may be a problem for researchers to pick an explanatory model when their findings go sometimes in one direction, and sometimes in the other, as in the case of Hidrobo and Fernald (2013).

In this paper I first summarize a competitive market model of work in household production (Grossbard-Shechtman 1984, henceforth GS84). The model was inspired by Gary Becker's competitive marriage market models (Becker 1973, 1981), especially one with heterogeneous market participants only found in Becker (1973).⁶ Then I invoke non-cooperative models where employers of work in household production, men given the traditional division of labor that is assumed, take advantage of women and possibly act violently. One of these models adapts the labor monopsony model, a standard economic model of firms and workers.

Advantages of this modeling approach include (1) simplicity and familiarity; (2) ability to account for a variety of empirical results, including seemingly contradictory findings regarding the association between intimate partner abuse and women's relative income opportunities; (3) adaptability to include other factors that are possibly determinants of IPV, and (4) identification

⁵ It shares some features with the sociological theory of "male backlash". According to Macmillan and Gartner (1999), when a wife gains economic independence a man may use violence as a means of reinstating his authority over his wife.

⁶ Becker's (1973, 1981) theory of marriage includes multiple models, as discussed in Grossbard (2010). The Treatise (Becker 1981, chapter on polygamy) only contains a simple market model with identical men and identical women. Most closely related to GS84 is a second market model of marriage with heterogeneous agents that only appears in Becker (1973).

of rarely considered factors that may be associated with IPV, such as funding of abortions of fetuses conceived due to rape.

Like standard textbook models in microeconomics and Becker's marriage market models the competitive market model presented here includes both cooperative and non-cooperative elements. The individual motivations are non-cooperative (is the baker cooperating to make us happy? Men and women want the best deal for themselves); the market equilibrium requires cooperation and coordination via the price mechanism (the baker ends up serving the best interest of the customer under conditions of perfect competition).

GS84 expands Becker's marriage market models to include household production, and thus was also inspired by Becker's (1965) allocation of time model. It is assumed that individual (dis)utility also derives from the products of household production or from the work in such production. There are workers in household production and employers. Utility functions are for individuals only. In contrast, Becker's (1965, 1973) production functions are unitary (at the household level) and married agents are assigned to their production tasks by household consensus or a household dictator.⁷

GS84 accommodates a variety of preferences regarding who works in household production and sexual orientation, including those compatible with traditional and egalitarian roles. The version used here assumes traditional gender roles: women are the workers who supply time in household production that benefits men and men possibly transfer them access to consumption goods in return. These assumptions are also found in Anderberg and Rainer's (2013) model of economic abuse.⁸ Like Becker (1973) GS84 also includes a market level, i.e. a macro dimension. It is assumed that markets for work in household production reach an equilibrium where demand and supply intersect. Implicit prices are set and affect all active and potential market participants: the singles looking for partners as well as married individuals who could possibly divorce and

⁷ Other economic models of allocation of time to household production that had a major impact on the economics literature include Mincer (1962), Heckman (1974) and Gronau (1973, 1977). They are all unitary in the sense that they assume that 'the' household makes decisions and thus push under the carpet possible conflicts between worker and agents benefiting from the work. Becker and Mincer may have learned from scholars from the Chicago School of Home Economics such Margaret Reid (1934) and her teacher Hazel Kyrk.

⁸ The similarity between our models derives from shared assumptions: in both GS84 and Anderberg/Rainer private consumption of goods enters in the individual utility functions of men and women and transfers within the household can influence a partner's allocation of time.

remarry. Becker (1973) and GS84 assume that women capture their equilibrium value if it is positive (in GS84 that value is always positive since the market is a sort of labor market and work always has an opportunity cost). Even though these prices are not observable they are associated with observable outcomes such as individual happiness, access to assignable individual consumption goods or services, and spending on household public goods such as children's education. Previous research has argued that these prices are associated with the ratio of births that are either out-of-marriage or out-of-couple (e.g. Ekert-Jaffe and Grossbard 2008, Alshaikhmubarak et al 2019). In this paper it is posited that these prices are associated with prevalence of intimate partner violence

The assumption that a voluntary-based market equilibrium is reached led Becker (1973, 1981) to conclude that 'polygamy is good for women' because under polygamy demand by men is high relative to the supply by women. Becker did not recognize that polygamy may not be good for women if men who dominate society prevent women from capturing their market value by instituting forced marriage or limits on alternative forms of employment for women. In contrast, in this paper I consider societies where men dominate women in the political and social realms and use their ensuing power in order to "underpay" their wives who work in household production for their benefit or force them to work more than they intended to.⁹ Two models are presented: a marriage market with high levels of male intimate partner violence aimed at women and a marriage market with monopsony.

Section 2 first summarizes the GS84 model and then integrates male domination into the analysis. Two models are presented: Model A, introducing the use of intimate partner violence by men, and Model B, a monopsony model based on labor market models. In both models men use their overall dominance in society to force women to work in household production at lower 'prices'. Section 3 discusses testable implications for the analysis of intimate partner violence, with special emphasis on links between IPV and women's relative income and income potential, IPV and divorce. Brief mention is also made of the possible role played by sex ratio variation,

⁹ This assumption is similar to an assumption in the Anderberg and Rainer's (2013) model, namely that only men have the option of being abusive towards their partner (which goes together with male domination in society).

laws and policies affecting women who have been raped, and laws regarding polygamy. Section 4 concludes.

2. **Markets for work in household with male domination**

First, markets for work in household production are analyzed following GS84 (see Grossbard 2015, Chapters 2 and 3 for a detailed presentation of the model).¹⁰ Heterosexuality is assumed. Henceforth marriage includes non-marital cohabitation. It is assumed that agents act out of free will, in line with Becker (1973, 1981) and most models of household decision-making in marriage, including cooperative models such as Horney and McElroy (1981) and Bourguignon et al. (1993). Intimate partner violence is incorporated into the analysis in Section 2.3.

2.1 Derivation of individual demands and supplies assuming individual utility maximization.

Utility function. Each agent maximizes utility subject to a time constraint and a budget constraint. Each individual agent's utility is a function of three possible uses of own time, time the spouse works for the benefit of the agent and commercial private goods. In turn, the three uses of own time are: work (in the labor force), leisure and time working in household production benefiting a spouse. In GS84 time in household production benefiting a spouse is called 'household labor'. Here it is called 'Work-In-Household or WIHO'. Own time devoted to producing household production benefiting oneself is included in leisure. Household public goods are ignored.¹¹ WIHO has opportunity costs because workers derive utility from goods and services that they produce with their own time and consume individually.¹²

The budget constraint is based on exogeneously determined prices of goods and wages that can be earned in the labor force. In addition, it is assumed that there are also given prices of WIHO, given to those who consider supplying their own WIHO and to those who consider 'buying' the

¹⁰ In a non-technical version of the model applied to a polygamous society with traditional gender roles this form of work benefiting a spouse was called 'wife-services' Grossbard (1976).

¹¹ A modified version of GS84 with household public goods can be found in Grossbard (2003).

¹² What Becker (1965) called commodities.

WIHO of a spouse. Prices of WIHO tend to be non-continuous and where women don't participate in the labor force prices are often defined as proportions of husband's income. In some societies there have been rules regulating what married women could earn from WIHO. For instance, full-time housewives could expect their husband's "whole wage" in working-class England after the industrial revolution (Woolley 2003). Likewise, until recently in Japan most husbands handed their entire paycheck to their stay-home wives and just kept some pocket money. Among dual-earner couples where women do more household production and men earn more in the labor force, couples often pool their incomes (Amuedo et al. 2011). Income pooling appears to be more common in industrialized countries than in countries with larger agricultural sectors such as India (Munro et al. 2014). This amounts to an internal income transfer allowing women to consume beyond their own earning capacity (Grossbard 2015). Were it not for some intra-household transfer from their husbands female WIHO-workers would starve to death in societies where they have no other way to make a living, as was the case among the Kanuris in Nigeria in the 1970s (Cohen 1967, 1971).¹³

In the case of suppliers of WIHO the income side of the budget equation includes possible transfers by the spouse that are the equivalent of earnings in labor markets: amount of time spent working multiplied by the price of WIHO. In the case of those who have a demand for WIHO the budget equation includes spending on a spouse's WIHO taking account of the price of such WIHO.

2.2 Markets and traditional gender roles

Supply and Demand. An individual supply of WIHO is like any other individual labor supply. The agents who have a demand for WIHO are like employers in labor markets. In standard economic models there is an obvious connection between workers' productivity in firms, how much they earn, and how much they consume. That is also the case in GS84: the suppliers of

¹³ Other societies where women were expected to do most of the household production and had very few rights include ancient Greece and Rome (see Lemennicier 1988) and traditional China men (see Cheung 1972). A similar situation is observed in many countries today.

WIHO expect compensation for their work from a spouse who benefits from it. Spouses ‘hire’ each other to do the WIHO they want at given prices. The larger the intra-household transfers the higher the individual consumption of the WIHO supplier.

Adding the assumption of traditional gender role. The WIHO model in GS84 is gender-neutral. I now assume traditional gender roles, implying that women supply WIHO and the demand for their work comes from men. These assumptions apply well to the Kanuris in the 1970s, where women were expected to do all of the household production, men not at all. They don’t apply as well to contemporary Western societies. Some of the discussion below may therefore be more suitable for societies more based on traditional gender roles than the USA or Germany.

Aggregating to market level. Assuming such traditional gender roles the following simple analogies apply: marriages==firms; husbands==employers of WIHO; and wives==WIHO-workers. The market for women’s WIHO depicted in Figure 1 is a competitive market. Assuming competition it will reach equilibrium point E_0 , where demand and supply intersect, corresponding to an equilibrium amount of WIHO Q_0 (a function of both number of participants and hours of work) and an equilibrium implicit price of WIHO y_0 .¹⁴ This price translates e.g. into certain levels of access to consumption goods and individual happiness for individual men and women. A lower price of women’s WIHO is expected to be associated with lower relative female consumption, more female suicides, lower female mental health, lower female happiness, and relatively more children born out-of-couple or extra-maritally (see Grossbard 2015).

WIHO market models can be constructed at different levels of aggregation, as is the case with labor market models. They could be macro models or there could be multiple interrelated hedonic markets, with a different equilibrium set in each market.

¹⁴ It also follows from the WIHO market model that there is no need for a separate economic theory of marriage such as Becker (1973). The WIHO market model explains marriage and other forms of cohabitation in a way similar to how conventional labor models explain employment level and labor relations. Just like there are different kinds of labor contracts between firms and workers, there are also different of organizations and institutions that regulate WIHO markets (see Grossbard-Shechtman 1993 and Grossbard and Lemennicier 1999).

Applications of the WIHO market models require circumventing data limitations regarding time in household production and WIHO prices. Past applications include studies of labor supply (in part a response to variation in the price of WIHO), assignable individual consumption and individual happiness (a lower price of women's WIHO is expected to be associated with women having less access to consumption goods, men more), savings, and individual happiness (see Grossbard 2015).

This analysis can be applied to derive predictions regarding the association between male IPV and female labor force opportunities. For example, consider separate markets for the WIHO of women with low and with high education as well as separate markets for men with low or high propensity towards violence.¹⁵ Assume that most women prefer non-violent men and are willing to work for them at a lower price of WIHO. Therefore, in equilibrium the price that non-violent men pay for a given amount of women's WIHO is lower than what violent men pay. Now assume that most men prefer educated women for they are more productive at WIHO (possibly because they can contribute more to the couple's children's human capital, as argued in Grossbard 1976). Therefore, in equilibrium the price that men are willing to pay for educated women's WIHO exceeds the price they are willing to pay for less educated women's WIHO. For example, women who attended an elite college may get paid more for their WIHO than women who went to average colleges (as argued in Hersch 2013). Furthermore, men who place a premium on educated women's WIHO may also have a low tendency to engage in IPV, as it is important for them that their wife and children be happy and successful. All individuals are pooled while they participate in these different markets for women's WIHO. The markets and the prices are not observed.

One may observe a negative association between IPV and women's labor force participation to the extent that more educated women who can afford to be picky due to the higher price of their WIHO end up marrying non-violent men, thereby giving up the further premium they could get for marrying men other women avoid. Some other observed voluntary matches may involve women with relatively low human capital willing to engage in more hours of WIHO and marrying men who want large amounts of WIHO, are less concerned about the quality of the

¹⁵ Tendency towards violence may be signaled by a number of behaviors observed while dating.

household production, and are more likely to engage in IPV (which is detrimental to wife and children). With their lower levels of human capital these women may also be less likely to participate in the labor force or to earn good wages. Such matching pattern also leads to a negative association between IPV on the one hand and women's labor force participation or relative wages on the other hand.

Some observed voluntary matches may also involve women with better labor market opportunities and men who are more prone to violence, perhaps because some so-called 'alpha' males with higher incomes and higher tendency towards violence end up married to women with higher education, expensive spending habits, and high tolerance for being abused. In that case the observed association between women's labor market opportunities and male-on-female IPV will be positive. Controlling for revealed relatively materialistic consumer choices, adults' history of abuse when growing up, and other preference shifters, I expect that for couples both preferring high levels of human capital in their children and living in free societies there will be a negative association between IPV and women's labor market opportunities.

2.3 Men using IPV to avoid market equilibrium prices of women's WIHO

In any labor market workers and employers have conflicting interests. In the case of WIHO markets, female WIHO workers want higher pay for their work; male employers of WIHO want to pay less. Employers may also want workers to supply more work at given prices of WIHO.

Adding the assumption of male domination. Domination of political and social institutions enables men to act as an interest group and organize ways to avoid a competitive equilibrium. This will allow them to (a) pay their WIHO workers less, and/or (b) get them to work more at WIHO.¹⁶ In terms of price setting, they will try to set a price of WIHO below y_0 . In principle, women can unite to pass laws and customs that benefit them by either getting the price of WIHO to rise or countervailing the negative impact of collective actions initiated by men. I assume that male domination prevents women from organizing politically to pursue their best interests as workers. Furthermore, interference with market forces in markets for WIHO may translate into

¹⁶ The economic literature that has viewed men or women as engaging in collective action in order to obtain better individual results includes Grossbard-Shechtman (1993, Chapter 5) and Nancy Folbre (1994).

actions forcing women to supply more hours of WIHO at given prices of WIHO (i.e. pushing women's supply of WIHO to the right).

There are different ways by which men can use collective actions to lower the price of women's WIHO. Next, I present a limited number of such actions. According to Model A men create high levels of male-on-female intimate partner violence so that direct coercion or threat of violence force women into accepting sub-optimal allocations of their resources. According to Model B men reach the same goal by acquiring monopsony power. Since the use of IPV does not exclude the use of other methods to that strengthen men's monopsony power I also examine possible links between reliance on intimate partner violence and other institutions that limit women's opportunities and boost men's monopsony in markets for WIHO.

Model A: Male domination and male intimate partner violence. Here men use violence to force female WIHO-workers to work at the price offered by men. WIHO then becomes a form of forced labor. Men's power is backed by laws, policies and customs that place low punishments on perpetrators of intimate partner violence and/or that are weakly enforced. Furthermore, the men may also rule that female victims of domestic violence are not eligible for protective services.

Figure 2 illustrates a situation where men have established a compensation for women's WIHO below the market equilibrium level. Due to intimate partner violence women are not free to respond by reducing the quantity of WIHO they supply. Actual violence or threat of violence (and the threat will be more real if there is a higher incidence of intimate domestic violence) force women to supply the same amount of work that they would have supplied at higher compensation levels, implying a vertical supply below the equilibrium price of WIHO. Women thus work more hours a day at household production than they would if they were free of the threat of intimate partner violence. WIHO workers who are actually abused often remain in abusive and sometimes dangerous relationships rather than leave.

Implications for determinants of IPV. One expects that the higher the equilibrium price of WIHO in a society, the more men will try to lower it by condoning domestic violence or failing to punish it effectively. The higher women's participation in the labor force and the more the

supply of women's WIHO lies to the left, the higher the equilibrium price of WIHO and the more it is likely that men who rule politically will fail to punish IPV. This implies that across various societies the relationship between IPV and women's labor force participation will be positive, and the more so the more men dominate the political and legal system. More specifically, IPV and women's labor force participation (or women's higher relative wages) are more likely to be associated positively in countries or cultures with more pervasive male domination of the political and legal system.

Furthermore, this reasoning may also imply a positive association between IPV and women's labor market opportunities at the level of individual observations. In their attempt to bring down the prices of all women's WIHO and to force all women to work more at WIHO than they would like to willingly, men may want to be particularly clear about the limits to women's attempts to thrive independently of men by using violence against the most talented women capable of acquiring more skills valued in the labor market. Husbands of such women may come from relatively high-status families and more likely to identify with a pro-IPV political and legal system. For similar reasons sexual harassment at work may target high profile women more than plain women and the perpetrators are more likely to have high status in the society (Manne 2018).

An alternative way for ruling men to use their power in order to lower the price of women's WIHO is to act as a monopsony. A monopsony is a market with one firm that is the only employer of workers with particular skills in a particular geographical area. This firm has no competition on the demand side of the labor market, but there are many workers on the supply side. Examples include markets where one firm such as a mining company or a hospital are the only employer. Monopsonies in labor markets were common in the 18th or 19th Century in the West when industrial workers' mobility was limited. Modern applications of the monopsony model to labor markets include Manning (2011) and Webber (2015). A group of employers could coordinate their hiring policies and act as a monopsony.

Model B: male domination and monopsonistic power in markets for women's WIHO. The monopsony model is applicable to markets for women's WIHO. Men obtain monopsony power

by acting as if they were a single employer of women's work in household production. Rather than allowing a competitive equilibrium to settle in the WIHO market depicted in Figure 1 men use monopsony power to force below-equilibrium price y_0 on workers, in this case women supplying WIHO. They may not necessarily calculate women's marginal factor costs (MFC) as in economics textbooks but nevertheless be able to impose a price of WIHO below level y_0 . To the extent that women's supply is upward-sloping at the lower price women will move down their supply curve and reduce the amount of WIHO they supply. Less WIHO may imply that some women will avoid marriage and cohabitation; others may supply fewer hours per week or fewer years of WIHO over their lifetime.

Men who dominate a society may use a number of strategies to strengthen their monopsony power in markets for women's WIHO: restrict women's labor force opportunities, restrict divorce, facilitate rapes and increase the cost of rape to women.

Restrict women's labor force opportunities. The men who dominate their societies have often limited women's opportunities to survive outside marriage or cohabitation. This adds to men's monopsony power in markets for women's WIHO and increases the likelihood that they will accept a below-equilibrium price of WIHO offered by men. In agricultural societies politically dominant men have often prevented women from owning land, limiting their financial independence. This is often the case in Africa today.¹⁷ For centuries in the USA and most of Europe married women were not allowed to own any property, including land. They were "covered" by their husbands. Most states in the USA only removed such coverture laws between 1850 and 1920 (see Alshaikhmubarak et al. 2019). In the USA men have also used their political power to restrict married women's participation in the labor force by imposing marriage bars (Goldin 1988, 1990), and such bars were also legal in Japan until 1986.¹⁸ Today in the USA only small communities restrict women's opportunities in ways reminding of the huge constraints imposed in the past. For example, the men who dominate polygamous communities at the

¹⁷ Where matrilineal and patrilineal tribes coexist, as is the case in Malawi, women are only prevented from owning land in the patrilineal tribes. The two kinds of tribes also differ in their treatment of women in case of divorce: in patrilineal Malawi tribes divorce is very rare; it is much easier to divorce in matrilineal tribes.

¹⁸ In Japan it is illegal since 1986 but firms still often limit their hiring of (married) women (Japan Times 2016).

Western border of Canada and the USA have settled in areas offering no or few employment opportunities for women.¹⁹

Restrict divorce. When men act collectively to limit women's options to divorce and remarry they act like landowners who owned serfs in Europe and coerced them to work only for their assigned landowner. In both cases workers can't switch employers. The extra monopsony power that such law gave owners explains why the reintroduction of serfdom in Denmark in 1733 led to a significant reduction in the wages of farmhands (Jensen et al. 2018). We don't have evidence on how restrictions on divorce have lowered the price of women's WIHO but we do know that when divorce became easier to obtain in the USA this led to a decrease in female suicides, a result associated with a higher price for women's WIHO in the USA (Stevenson and Wolfers 2006). In contrast, easier divorce did not lead to a significant decrease in male suicides.

Increasing the frequency of rape and raising its cost to women. Some societies force women to marry their rapist.²⁰ This implies that society grants rapists legal rights over the child conceived as a result of the rape. Such law is expected to increase the incidence of rape in society and therefore individual women's fear of being raped. In turn, this fear is likely to push some women into entering marriage or cohabitation and to discourage others from leaving an abusive husband. This adds to men's monopsony power in the market for women's WIHO. Policies and laws raising women's cost of being raped are also expected to increase the incidence of rape and therefore to add to men's monopsony power in markets for women's WIHO. For instance, women's costs of being raped rise when states remove funding of abortions of fetuses conceived through rape or make it a crime for women to abort a fetus conceived as a result of rape, as was recently ruled in the state of Alabama. Any policy or law raising the probability of rape among unmarried women or the cost of a potential rape is thus likely to be associated with the above-mentioned five outcomes reflecting a lower price of women's WIHO.

¹⁹ Polygamists may be especially motivated to lower the price of women's WIHO below its market equilibrium level given that their societies only allow men to marry multiple wives without allowing women to marry multiple husbands and this imbalance pushes up the equilibrium price of women's WIHO.

²⁰ Alternatively, rape may be illegal but laws prohibiting it are not be adequately enforced.

IPV and other ways to lower the price of women's WIHO: complements or substitutes?

Each one of the methods contributing to men's monopsony power in their society could be a substitute for the use of IPV. All these methods are meant to force women to accept sub-equilibrium conditions in markets for their WIHO. Alternatively, use of violence and institutions restricting women's choices could work together to help dominant men take advantage of women. For instance, wife abuse and restrictions on wives' employment are complements in the case of men perpetrating 'economic abuse' against their wives (see Anderberg and Rainer 2013). To the extent that intimate partner violence and *restrictions on women's labor force opportunities* are substitute ways by which politically dominant men squeeze women into accepting lower prices for their WIHO there will be a lower incidence of intimate partner violence in societies that place more restrictions on women's financial independence from men via getting jobs in the labor force and getting paid more at such jobs. The observed correlation between incidence of intimate partner violence and labor force participation of women will then be positive. If the methods are complements (for instance, in some societies women are generally treated more poorly than in others, e.g. because they don't vote or are otherwise excluded from the political system) cross-national or cross-cultural comparisons will show a negative association between IPV and women's labor force participation (as these societies place more restrictions on such participation).

If intimate partner violence and *legal or religious prohibitions on divorce* are substitute means of preventing women from leaving abusive relationships, then societies making divorce difficult will have a lower incidence of intimate partner violence. This implies a positive association between the divorce rate and IPV. Alternatively, it is also possible that divorce prohibitions and intimate partner violence are complementary: IPV may be less effective a way to force women to do more WIHO if they can easily leave their abuser to marry or cohabit with another man who treats them better in return for their work in household production. This would imply that societies with high IPV rates have low divorce rates, i.e. a negative association between incidence of IPV and divorce.

If intimate partner violence and *laws and policies raising the incidence of rape or its cost to women* are substitutes, cross-cultural comparisons will indicate a negative association between incidence of rape and intimate partner violence. However, it is also possible that where men are more violent there will be both more rapes and more intimate partner violence. In regimes of high IPV men may not want women to leave the marriage and the fear of being raped if they leave may lead them to stay with their abuser. In this case cross-country comparisons will reveal that the two behaviors are positively correlated. The tighter men's grip on society the more it is likely that all means of oppression of women—via IPV, limited income-generating opportunities outside marriage, restricted divorce and rape-related policies--are combined.

How stable are regimes based on Model A or Model B?

Regimes involving male domination of the political and legal system in order to keep women's WIHO cheaper or more available may possibly get weakened due to reactions on the part of women (and their parents if they are not autonomous) and men removed from political power centers.

The elasticity of supply affects men's gains from acquiring monopsony power. The more elastic women's supply, the less men stand to gain from imposing lower prices of WIHO. Using IPV to force women to accept lower prices of WIHO is also more problematic if women have alternatives to marriage and want to reduce the amount of WIHO they supply at below-equilibrium prices. In turn, the elasticity of women's supply of WIHO—i.e. the degree to which women respond to changes in prices and other opportunities--is a function of how much time they have to react. The long run supply is likely to be more elastic than the short-run supply. In the very long run one generation is replaced by another and social norms may change, possibly changing the institutions that translate male domination into low pay for women's WIHO. In some societies parents are more successful at supporting the system and force marriage upon their daughters.²¹ New generations of young women who saw their mothers being abused (or

²¹ In turn, this implies limits on parental empathy and altruism towards daughters who suffer from intimate partner violence, and identification with the best interest of sons who obtain women's WIHO at a cheaper price when intimate partner violence is prevalent.

being victims of violence in the case of Model A) may be reluctant to marry. In an increasingly global culture one hopes that parents of girls find it increasingly difficult to force their daughters to enter abusive situations.

In the long run societies with high levels of IPV or male monopsony may also experience instability due to increases in male-to-male conflicts. To maintain a monopsony when supply is not totally inelastic implies that to maintain low prices of women's WIHO ruling men have to prevent other men from entering the market. To maintain a system based on IPV the men who have more power may also direct their violence at men who are challenging their status. They may also direct violence at outsiders defending the rights of victims of violence, such as journalists or judges.²² How long is the long run? Is it a generation? More than one generation? Economists are increasingly recognizing that cultural norms affect outcomes such as labor supply, wages, and fertility. These cultural norms are intertwined with legal, political and social structures. Individual preferences may not change much over time, and that includes gender roles and willingness to impose oneself on others via violence or suppression of attractive opportunities.²³

3. Summary and implications for empirical work related to intimate partner violence.

There is a broad-based agreement among researchers of household outcomes that when studying income effects on an outcome such as IPV it is necessary to consider effects of each adult household member's individual income or income opportunities separately. This is also the approach presented here. Another underlying assumption in all the literature on IPV and domestic abuse is that such abuse and violence are embedded in traditional gender roles. This is also assumed here.

²² A female journalist was recently killed in Mexico after having spoken out on #violence against women and children in response to the recent killing of a 7-year-old girl in Mexico City.<https://buff.ly/3aliao>
https://www.democracynow.org/2020/2/21/headlines/mexican_radio_journalist_murdered_in_ciudad_juarez

²³ For example, in the Australian provinces where there was an extremely high sex ratio in the early 19th Century gender roles continue to be more traditional than in other parts of Australia where the sex ratio was not as imbalanced around the time that Australia built its national character (Pauline Grosjean and Rose Khattar 2019). Another example of sticky gender roles is that the only US state that had polygamy in the 19th Century also became the first to legitimize the institution in the 21st Century (recent news item).

Revisiting the connections between IPV and Income.

The existing literature offers mixed evidence regarding the association between IPV and women's income and income opportunities: in some cases it is negative and in others positive. Cooperative bargaining models help explain why women's economic opportunities are negatively related to IPV: they assume that men have preferences for perpetrating intimate partner violence towards their female partners and model a bargaining process involving women "paying" men to reduce their violent behavior. Higher relative earnings help women buy their freedom from IPV. Non-cooperative models help explain evidence pointing to a positive association between male abusive behavior and women's economic resources. They see men's violent or abusive behavior as a response to women reducing their work in household production when they have better opportunities to make an independent living. It is a bit of a problem if researchers have to be ready to choose between cooperative and non-cooperative bargaining models depending on what they find. Instead, I proposed a simple conceptual framework based on labor economics and the multiple parallels between household production and production for firms.

In section 2 men were viewed as employers of women who work in household production and possibly get paid for such work. I called this type of work Work-In-Household or WIHO. I then introduced WIHO markets. These markets can be free, in which case a market equilibrium is obtained, implying an equilibrium price and quantity. Given widespread heterogeneity among individual participants there will be multiple hedonic markets, each setting a price for the WIHO of a particular type of woman married to a particular type of man. It was argued that under such circumstances it is most likely that there will be a negative association between women's relative income opportunities and IPV. This scenario shares some features in common with cooperative bargaining model, except that it requires the operation of markets. The underlying assumption of the standard labor model is that all participants are individual utility maximizers who compete with each other and only end up cooperating with others via the price mechanism.

However, free markets for women's WIHO are more likely to be the exception than the rule, especially from a global and historical perspective. Assuming male domination I then presented

two types of models according to which men prevent women from obtaining the market value of their WIHO. Model A has men using violence to force women into accepting lower prices. Model B has men creating monopsonies with the same goal in mind. Under both models women are worse off. Under model A men use IPV and wife abuse as means to prevent women from capturing the true value of their WIHO. More talented women with better opportunities outside marriage are likely to command a higher price for their WIHO and therefore they are more likely to be targets of IPV. This scenario shares common features with non-cooperative bargaining models, but again, it includes a market analysis based on the aggregation of all individual participants either on the demand side or the supply side.

Furthermore, I also introduced a monopsony model as an alternative way by which men can force women to accept prices for their WIHO that are below the price they would have gotten in free markets. Depending on whether the use of violence complements the monopsony model or is a substitute for it I expect either a positive or a negative association between IPV and women's labor force opportunities. In sum the old labor market model, with some adaptations, serves as a unifying conceptual framework that is compatible with findings of negative as well as positive associations between women's relative economic opportunities and spousal abuse or violence. If the association is negative, it is more likely that markets are free. If it is positive it is more likely that male domination prevails and influences prices and amount of WIHO supplied.

Reverse causality. Women may enter the labor force precisely because they are dissatisfied with their earnings from WIHO. The more elastic their supply of WIHO the more they are likely to enter a substitute form of labor (such as work for commercial firms) when the price of WIHO goes down and the ruling men don't prevent them from doing so.

Other factors possibly associated with IPV

The following is a partial list of testable implications.

Divorce. Two empirical studies have linked changes in divorce laws to incidence of intimate partner violence. Brassiolo (2016) found that when an unexpected and comprehensive reform of

divorce legislation took place in Spain in 2005²⁴, implying a substantial drop in divorce costs, there was a decrease in the incidence of spousal violence due to (1) some couples experiencing intimate partner violence getting a divorce and (2) fewer married couples experiencing intimate partner violence.²⁵ Stevenson and Wolfers (2006) found that in US states that introduced unilateral divorce (which drops the costly requirement of mutual agreement) there was roughly a 30 percent decline in domestic violence for both men and women.²⁶

These findings have been explained with other theories in the past. According to the approach presented in this paper the presence of IPV is related to male attempts to reduce the wellbeing of women who supply WIHO for the benefit of men. With more difficult divorce laws women are more likely to be stuck in their marriages even if they undergo domestic abuse, including IPV. One implication of the low price they get for their WIHO is that they may prefer to take their own life.

Sex ratio. Higher sex ratios are expected to be associated with a higher demand for WIHO and thus higher market price of WIHO (see Grossbard-Shechtman 1993). Such higher prices are likely to induce politically dominant men to use their power in markets for WIHO, and this may involve more use of intimate partner violence. A testable prediction is thus that more intimate partner violence may be found where sex ratios are higher. At the same time, more men relative to the number of women may also lead to more conflicts among men, which may make it difficult for men to organize into collective action groups aimed at lowering the price of women's WIHO via encouragement of intimate partner violence. So the net predicted effect of higher sex ratios on a society's incidence of intimate partner violence is ambiguous.

Polygamy versus monogamy. As pointed out by Becker (1973), when men are allowed to marry multiple wives but women are limited to one husband this raises the market demand for women's WIHO and would lead to higher equilibrium prices for such WIHO. However, higher

²⁴ The reform made divorce unilateral, eliminated need for fault and eliminated the requirement of mandatory legal separation before divorce, thus reducing the length of time needed to effectively dissolve a marriage.

²⁵ Brassiolo also found that women with young children, who may find divorce more costly out of concern for their children's best interest, were less likely to leave an abusive relationship after the divorce reform.

²⁶ They also found that when divorce laws made divorce more difficult, as was the case prior to 1970 in California, married women were more likely to commit suicide.

equilibrium prices are likely to induce men into collective action aimed at reducing the price of women's WIHO (Grossbard-Shechtman (1993) via strategies such as those presented in Models A or B.²⁷ Therefore women may not be better off in societies with polygamy than in societies that prohibit plural marriages.

Cost of post-rape abortions. It was argued in Section 2 that the frequency of rape and women's cost of post-rape consequences are likely to have an effect on men's monopsony power in markets for WIHO. In turn this power is expected to be associated with IPV. Married women are therefore likely to be treated with more abuse if the prospect of leaving a marriage is more risky for women, due to the higher cost of having an abortion if they get raped.

4. Conclusions.

The existing literature offers mixed evidence regarding the association between IPV and women's income and income opportunities: in some cases it is negative and in others positive. Conceptual frameworks that have previously been used to explain this association and other findings regarding the determinants of IPV and in-couple abuse tend to be bargaining models, either cooperative or non-cooperative. Given the variety of results, with the association occasionally being positive for one subsample of the same experiment and negative for another, there is a need for a more comprehensive framework. In this paper I have outlined such a framework by drawing on Becker's (1973) theory of marriage and on well-known models from labor economics: competitive labor markets and monopsonistic ones assuming male domination of political and legal systems. The concept of WIHO (Work-In-Household) helps in pointing out parallels between work at home and work in the labor force.

This paper offers a number of ideas for future empirical research. For example, it is predicted that married women are more likely to be abused if they face higher costs of having an abortion if they get raped. These higher costs make it more risky to leave an unhappy marriage. When

²⁷ This is one of the arguments I made to the Supreme Court of British Columbia. This and other arguments by a number of witnesses led the judge to decide that polygamy should continue to be illegal (Grossbard 2016).

Louisiana recently criminalized such abortions it may have given the green light to more abuse among couples, married or not.

In the USA and most Western countries marriage bars have been removed. Costs of divorce have been lowered considerably. With more IPV being male-against-female than vice-versa easier divorce has liberated more women than men from the suffering associated with IPV. Women have gained considerable rights in the last 150 years, including the right to own property (mostly in the years 1850 to 1920 in the USA) and even more recently the right to vote. Similar trends are occurring in the rest of the world. While still prevalent forced marriages and child marriages are on their way out. However, domestic violence, including intimate partner violence, is still widespread. Why does this violence remain so common, even higher income countries? To understand intimate partner violence it is important to recognize the role played by male domination over social, political and religious institutions. Free marriage markets are compatible with some couples experiencing IPV, but it is more likely that violence and abuse in the home are tied to non-competitive ways by which men interfere with the operation of marriage markets.

To the extent that they force women to accept below-equilibrium compensations for their WIHO men cause sub-optimal levels of household production. Insufficient time is spent caring for children, the sick, and the elderly in their homes. With increasing evidence regarding the importance of parental investments in young children (see e.g. Cunha and Heckman 2009) and with aging populations in need of more caregiving by younger generations, it is important that individuals obtain better incentives to supply caring work. The eradication of intimate partner violence matters not only for reasons of justice and equity, but also in order to enable those who do the work in household production to obtain a better pay. If men pay more for the WIHO they benefit from, more household production will be performed. Labor supplies are mostly positive. We know that from many other studies, where data about the price of labor are readily available.

The clearer we are in our understanding of what is observed, the more chances we have to make positive changes towards true equality and mutual respect both at home and at work. Challenges abound: both domestic violence at home and sexual harassment are very difficult to eradicate.

Economists can contribute to the construction of a better world, where women are not as oppressed as they are now; where men don't try as often to squeeze them out of surplus generated either at work or at home. We can contribute to intelligent conversations on how to get there, starting with our own economics profession. The institutions that have vested male domination will not disappear on their own. We can help generate more understanding of the broader consequences of the criminalization of rape-related abortions or the legitimization given to monopsonistic polygamists, two examples facing us in the USA today. Economists truly dedicated to the eradication of violence aimed at women need to work together and learn from each other.

References

- Aizer, A. (2010). "The gender wage gap and domestic violence." *American Economic Review* 100:1847–1859.
- Alshaikhmubarak, H., R. Geddes and S. Grossbard (2019) "Single Motherhood and the Abolition of Coverture in the United States" *Journal of Empirical Legal Studies* 16:1:94-118,
- Amaral, Sofia, Siddhartha Bandyopadhyay and Rudra Sensarma (2015). "Employment programmes for the poor and female empowerment: the effect of NREGS on gender-based violence in India" *Journal of interdisciplinary economics* 27(2): 199-218.
- Amuedo-Dorantes, C., J. Bonke and S. Grossbard (2011). "Income Pooling and Household Division of Labor: Evidence from Danish Couples" *IZA Discussion Paper No. 5418*.
- Anderberg, Dan and Helmut Rainer (2013). "Economic abuse: A theory of intrahousehold sabotage" *Journal of Public Economics*. 97:282-295.
- Angelucci, M. (2008). "Love on the rocks: alcohol abuse and domestic violence in rural Mexico" *B.E. Journal of Economic Analysis and Policy: Contributions to Economic Analysis and Policy* 8(1), Article 43.
- Becker, G.S. (1965). A theory of the allocation of time. *Economic Journal*, 75:493-515.
- _____. (1973). "A theory of marriage: Part I." *Journal of Political Economy*, 81:813-846.
- _____. (1981). *A treatise on the family*. Cambridge: Harvard University Press.
- Beleche, Trinidad (2019). "Domestic violence laws and suicide in Mexico." *Review of Economics of the Household* 17: 229–248.
- Bloch, F. and V. Rao (2002). "Terror as a bargaining instrument: a case study of dowry violence in rural India." *American Economic Review* 92.

- Bourguignon, F., M. Browning, PA Chiappori and V. Lechene, (1993). "Intra household allocation of consumption: A model and some evidence from French data" *Annales d'Economie et de Statistique*, :137-156.
- Brassiolo, Pablo. (2016). Domestic violence and divorce law: When divorce threats become credible. *Journal of Labor Economics*, 34(2): 443-477.
- Card, D. and G. Dahl (2011). "Family violence and football: the effect of unexpected emotional cues on violent behavior." *Quarterly Journal of Economics* 126:103–143.
- Chen, Z. and F. Woolley (2001). "A Cournot–Nash model of family decision making." *The Economic Journal* 111:722–748.
- Cheung, S. N.S. (1972). The enforcement of property rights in children, and the marriage contract. *The Economic Journal*, 82:641-657.
- Cohen, Ronald (1967), *The Kanuri of Bornu*. New York: Holt, Rinehart, and Winston.
- _____. (1971), *Dominance and Defiance*. Washington: American Anthropological Association.
- Cunha, Flavio and James J. Heckman. 2009, "The Economics and Psychology of Inequality and Human Development" *J Eur Econ Assoc.* 7(2): 320–364.
- Ekert-Jaffe, O. and S. Grossbard. (2008). "Does Community Property Discourage Unpartnered Births?" *European J of Political Economy* 24(1):25-40.
- Farmer, A. and J. Tiefenthaler (1997). "An economic analysis of domestic violence." *Review of Social Economy* 55:337–358.
- Folbre, Nancy. (1994), *Who pays for the kids: gender and the structures of constraint*. New York: Routledge.
- Goldin, Claudia (1988), "Marriage Bars: Discrimination against Married Women Workers, 1920's to 1950's" NBER Paper 2747, October.
- _____. (1990), *Understanding the Gender Gap*. Oxford: Oxford University Press.
- Gronau, Reuben (1973), "The Intrafamily Allocation of Time: The Value of Housewives' Time." *American Economic Review* 63:643-51.
- _____. (1977), "Leisure, Home Production, and Work--The Theory of the Allocation of Time Revisited." *Journal of Political Economy.* 85:1099-124.
- Grosjean, Pauline and Rose Khattar (2019). "It's Raining Men! Hallelujah? The Long-Run Consequences of Male-Biased Sex Ratios" *Review of Economic Studies* 86(2): 723-754.
- Grossbard, Amyra. (1976). An economic analysis of polygamy: the case of Maiduguri. *Current Anthropology*, 17:701-7.
- Grossbard, Shoshana (2010). "How 'Chicagoan' are Gary Becker's Economic Models of Marriage?" *J of History of Economic Thought*, 32(3):377-395, September 2010.

- _____. (2015) *The Marriage Motive: A Price Theory of Marriage. How Marriage Markets Affect Employment, Consumption and Savings*. Springer.
- _____. (2016). "Polygamy and the Regulation of Marriage Markets" in *The Polygamy Question*, edited by Janet Bennion and Lisa Fishbayn Joffe. Logan (Ut.): Utah State University Press/University Press of Colorado.
- Grossbard-Shechtman, Amyra. (1984), "A Theory of Allocation of Time in Markets for Labor and Marriage." *Economic Journal* 94:863-82.
- Grossbard-Shechtman, Shoshana. (1993), *On the Economics of Marriage*. Boulder CO: Westview Press. [reprinted by Routledge (2019)]
- _____. (2003). "A Consumer Theory with Competitive Markets for Work in Marriage," *Journal of Socio-Economics*, 31(6):609-645.
- Grossbard-Shechtman, Shoshana and Bertrand Lemennicier (1999). "Marriage Contracts and the Law-and-Economics of Marriage: an Austrian Perspective," *Journal of Socio-Economics* 28: 665-690.
- Heath, Rachel (2014). Women's Access to Labor Market Opportunities, Control of Household Resources, and Domestic Violence: Evidence from Bangladesh," *World Development* 57:32-46.
- Heath, Rachel and Xu Tan (2019). "Intrahousehold Bargaining, Female Autonomy, and Labor Supply: Theory and Evidence From India" *Journal of the European Economic Association* 00(0):1-41.
- Heckman, James J. (1974). "Shadow Prices, Market Wages, and Labor Supply." *Econometrica* 42:679-694.
- Henke, A and L.-C. Hsu (2018). "The impacts of education, adverse childhood experience, and nativity on intimate partner violence." *Journal of Family and Economic Issues* 39(2), 310-322.
- _____. (2020). "The gender wage gap, weather, and intimate partner violence." *Review of Economics of the Household*, June (forthcoming).
- Hersch, Joni. (2013). "Opting Out Among Women with Elite Education." *Review of Economics of the Household* 11:469-506.
- Hidrobo, M. and L. Fernald (2013). "Cash transfers and domestic violence" *Journal of Health Economics* 32(1): 304-319.
- Japan Times, (2016) "Still a struggle for working women." April 8, Opinion Section.
- Jensen, Peter Sandholt, Cristina Victoria Radu, Battista Severgnini and Paul Sharp (2018). "The introduction of serfdom and labor markets." University of Warwick WP, November, No 393.
- Konrad, K.A. and K.E. Lommerud (1995). "Family policy with non-cooperative families." *The Scandinavian Journal of Economics* 97:581-601.
- Lemennicier, Bertrand (1988), *Le Marche du Mariage et de la Famille*. Paris: Presses Universitaires de France.
- Lundberg, Shelly and Robert A. Pollak (1993). "Separate Sphere Bargaining and the Marriage Market." *Journal of Political Economy* 101:988-1010.

- Macmillan, R. and R. Gartner (1999). "When She Brings Home the Bacon: Labor-Force Participation and the Risk of Spousal Violence against Women." *Journal of Marriage and Family* 61(4):947.
- Manne, Kate (2018). *Down Girl – The logic of misogyny*. Oxford University Press.
- Manning, Alan (2011). "Imperfect Competition in the Labor Market" Chapter 11 in *Handbook of Labor Economics* Volume 4, Part B edited by David Card and Orley Ashenfelter. Northholland-Elsevier.
- McElroy, Marjorie B. and M.J. Horney (1981). "Nash Bargained Household Decisions: Toward a Generalization of the Theory of Demand." *International Economic Review* 22:333-49.
- Mincer, Jacob (1962), "Labor Force Participation of Married Women: a Study of Labor Supply." In *Aspects of Labor Economics* edited by H. Gregg Lewis. Princeton, N.J.: Princeton University Press.
- Munro, Alistair, Bereket Kebede, Marcela Tarazona-Gomez, and Arjan Verschoor (2014). "Autonomy and Efficiency. An Experiment on Household Decisions in Two Regions of India." *Journal of the Japanese and International Economies* 33: 114–133.
- Reid, Margaret (1934), *The Economics of household production*. J. Wiley & Sons, Inc.
- Stevenson, Betsey and Justin Wolfers 2006. "Bargaining in the shadow of the law: Divorce laws and family distress" *Quarterly Journal of Economics* 121(1): 267-288.
- Tauchen, Helen V., Ann D. Witte and Sharon K. Long (1991). "Domestic Violence: A Nonrandom Affair." *International Economic Review* 32(2): 491-511.
- Webber, Douglas A. (2015). "Firm market power and the earnings distribution" *Labour Economics* 35:123-134.
- Woolley, Frances (2003), "Marriage and Control over Money." In *Marriage and the Economy*, ed. S. Grossbard-Shechtman. Cambridge and New York: Cambridge University Press.

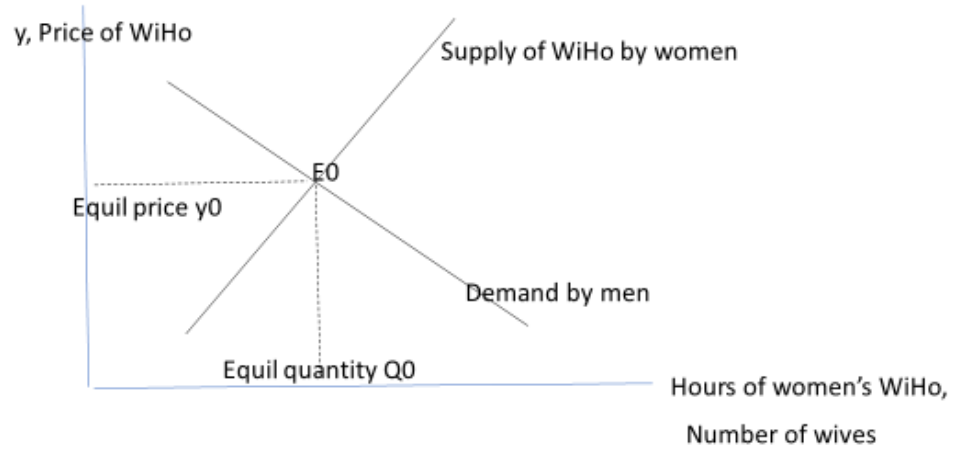


Fig. 1 A Market for Women's WiHo benefiting Men
 assuming heterosexuality, trad'l gender roles, only one type of woman, only one type of man

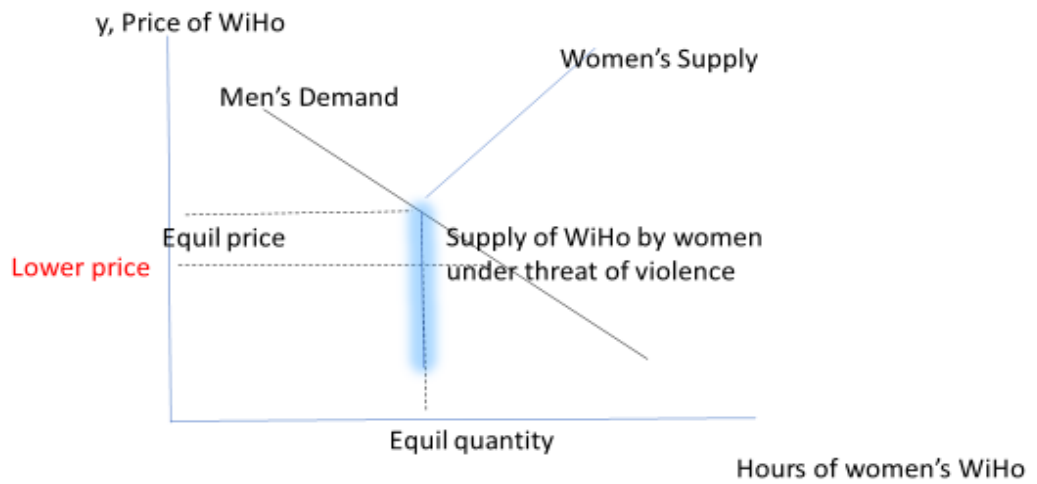


Figure 2. A market for women's WiHo with male Intimate Partner Violence (IPV). In Short run vertical supply segment.

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