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Violence against women, innate preferences and financial inclusion

Abu Zafar M. Shahriar [a,*], Quamrul Alam [b]

[a] Monash Business School, Monash University, 20 Chancellors Walk, Clayton VIC 3800, Australia
[b] School of Business and Law, Central Queensland University Melbourne, 120 Spencer St, Melbourne VIC 3000, Australia

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ABSTRACT

We examine the impact of intimate partner violence (IPV) on the decision of low-income women to enter formal financial markets by opening a bank account. Additionally, we investigate potential behavioral explanations for the connection between IPV and account-opening decisions. In laboratory experiments conducted in rural Bangladesh, we find that victims of IPV tend to be more risk tolerant and impatient compared to others. When given the option to open a bank account without fees, women who experienced IPV in the past 12 months are less likely to do so than those who did not experience such violence. A path analysis reveals that differences in risk tolerance and impatience mediate the relationship between IPV exposure and financial exclusion. Essentially, our findings indicate that exposure to IPV increases risk tolerance and impatience in women, which in turn discourages them from opening a savings account.

1. Introduction

Over the last decade, there has been significant progress worldwide in the ownership and use of formal financial accounts (i.e., financial inclusion) (World Bank, 2022). Yet, women are nine percentage points less likely than men to own a bank account in low-income countries, and this gender gap has "stubbornly" persisted despite significant supply-side interventions (Hess et al., 2021). This study investigates whether there is a link between gender-based violence—a global public health problem—and women's financial inclusion.

Intimate partner violence (IPV) is the most prevalent form of gender-based violence, which affects the physical and psychological wellbeing of one-third of women worldwide (United Nations, 2015; World Health Organization, 2013). While no formal study has investigated the relationships between IPV and women's financial inclusion, the theory of household bargaining (Manser and Brown, 1980) implies that victimization may hasten women's participation in formal financial markets. According to this theory, factors that increase women's control over household resources, such as paid employment, increased wage and earnings, and financial independence, reduce their likelihood of abuse in the household (Aizer, 2010; Farmer and Tiefenthaler, 1997; Pronyk et al., 2006). Therefore, a rational choice for an abused woman is to accumulate wealth over time to reduce financial dependence on the abusive partner. This implies a higher likelihood of bank account opening by the victims of IPV, which can provide them with a safe and convenient option to accumulate savings and thus gain financial independence. However, extant evidence suggests that gender differences in account ownership are the largest in the so-called belt of classic patriarchy (Hess et al., 2021), where the incidence and

* Corresponding author.
E-mail addresses: shahriar.abuzafar@monash.edu (A.Z.M. Shahriar), q.alam@cqu.edu.au (Q. Alam).

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severity of domestic violence are also the highest (World Health Organization, 2013). The social structure of this region—ranging from North Africa to the Middle East to the northern part of the Indian subcontinent, including Bangladesh—is characterized by men's control over female family members (Kandiyoti, 1988; Kabeer, 1988). On the one hand, this form of female subordination generates women's dependence on men, particularly when it comes to financial decisions, including banking (Singh, 2017). On the other hand, it is common for men in these societies to use violence to establish control over female family members (Bloch and Rao, 2002; Schuler et al., 1998). We formally investigate whether exposure to physical or sexual violence by intimate partners affects low-income women's decision to open a bank account. We further explore whether there is any behavioral explanation for the link between IPV and account-opening decisions of low-income financially excluded women.

Prior research has reported significant physical and psychological health-effects of gender-based violence. For example, victims of IPV experience aversive emotions and chronic pain (Ellsberg et al., 2008; Garcia-Moreno et al., 2006), which often has long-lasting effects on the victims' risk tolerance and their level of patience (Loewenstein, 1996 and Loewenstein, 2000). Risk and time preferences have significant impact on economic decision-making, including the decision to open a savings account. For example, people with high temptation to meet immediate consumption needs are less likely to open a savings account than others (Ashraf et al., 2006). Research has further shown that without a formal insurance market, a savings account provides low-income individuals with insurance against risk (Prina, 2015) and that risk tolerant individuals have less demand for such insurance coverage (Cameron and Manisha, 2015). Based on this literature, we conjecture that exposure to IPV increases risk tolerance and impatience in women, which in turn discourages them from opening a savings account.

To test our conjecture, we collected data from rural Bangladesh, where the incidence and severity of gendered violence are high (World Health Organization, 2013) and women's participation in the formal financial sector is low (World Bank, 2022). We collected data in multiple stages. First, we conducted a baseline survey with low-income, currently married women of reproductive age. We collected information on their account ownership, financial literacy, and other socio-demographic characteristics. Based on this survey, we recruited 446 women who did not have an account with a formal financial institution. These unbanked women participated in laboratory experiments and revealed their risk and time preferences in the laboratory.[1] In a post-experiment survey, we asked them about their experience of spousal violence. At this stage, we offered these women—in collaboration with a local bank—an option to open a savings account without account opening or maintenance fees.[2] We observed their account opening decision over the next three months. Finally, in a follow-up survey, we interviewed the women who opened a bank account following our intervention, and collected information on their account usage.

We find that women who experienced physical or sexual violence by their husbands in the last 12 months are more risk tolerant and more impatient compared to those who were not exposed to such violence. Abused women are also less likely to open a savings account than non-abused women. A potential caveat is that pre-existing differences between abused and non-abused women may explain these differences. Furthermore, self-reported measures of domestic violence are prone to non-random under-reporting (Aizer, 2010; Ellsberg et al., 2008), which implies that our findings may suffer from reporting bias. We conduct robustness checks, including an instrumental variables test, and confirm that the effects of IPV on risk- and time-preferences and account opening decisions are unlikely to be explained by unobserved heterogeneity or systemic under-reporting of violence experience. Finally, the results of causal mediation tests (Baron and Kenny, 1986; Breen et al., 2013; Karlson et al., 2012; Kohler et al., 2011) reveal that differences in risk tolerance and impatience mediate the relationship between IPV exposure and financial exclusion. In other words, exposure to IPV increases risk tolerance and impatience in women, which in turn discourages them from opening a savings account.

This study makes important contributions to the literature. A large number of studies have identified negative health effects of IPV (for a review, see Adler and Johnson, 2015; Ellsberg et al., 2008). To the best of our knowledge, this is the first study to show that exposure to IPV alters women's risk- and time-preferences. Although orthodox economic theory suggests that such preferences are immutable individual characteristics (e.g., Stigler and Becker, 1977), laboratory-based field experiments reveal that experiencing trauma and shocks, such as war-related violence or the devastation of natural disasters, constitutes persistent effects on preferences related to risk and time discounting (e.g., Callen, 2015; Callen et al., 2014; Cameron and Manisha, 2015; Cassar et al., 2017; Eckel et al., 2009; Voors et al., 2012). We add to this literature by showing that being exposed to violence at home also alters a woman's innate preferences.

This study also contributes to the growing literature on financial inclusion (e.g., Chen et al., 2024; Zhu et al., 2021). Improved access to financial services is positively correlated with income and employment (Bruhn and Love, 2014), household wealth accumulation and financial security (Célerier and Matray, 2019), increased household consumption and savings (Lee et al., 2021), and

[1] We adapted well-established experimental game protocols, which can be easily comprehended by subjects outside the usual convenient sample of undergraduate students. We implemented the risk task (based on Harbaugh et al., 2002 and Voors et al., 2012) as a series of choices between playing a simple gamble and receiving a specific amount of money. In the time discounting task (based on Bauer et al., 2012 and Voors et al., 2012), we presented subjects with a set of simple pair-wise choices between receiving an amount of money in the near future and receiving a larger amount at a later time. In section 3, we discuss the experimental protocol in a greater detail.

[2] This intervention was motivated by prior research suggesting that financial incentives–either as small subsidies or in the form of reduced account opening costs–stimulate the demand for formal bank accounts in low-income communities (e.g., Cole et al., 2011; Dupas et al., 2018, 2019; Prina, 2015).

entrepreneurship (Mao et al., 2023; Sun and Xie, 2024; Zhang et al., 2023).[3] Given such importance of financial inclusion, several researchers have investigated the barriers that limit access to formal bank accounts in low-income communities, particularly among women (for a review, see Buvinić and O'Donnell, 2019). We contribute to this literature in two primary ways. First, our findings suggest that the widespread prevalence of gender-based violence can explain—at least partially—gendered constraints of financial inclusion in low-income countries. Prior research has identified positive aspects of family and family-support in promoting financial inclusion (e.g., Yan and Qi, 2021). In contrast, we emphasize a detrimental aspect of family relationships affecting low-income women's decision to enter financial markets. Second, prior research on financial inclusion has highlighted the role of macro-institutional risk and uncertainty (e.g., Lee et al., 2022). In contrast, we emphasize the role of individuals' risk- and time- preferences in affecting financial inclusion.

The rest of the paper is organized as follows. In Section 2, we discuss the background literature. In Section 3, we discuss the severity of IPV and the landscape of women's financial inclusion in Bangladesh. In Section 4, we discuss our data collection process. In Section 5, we present our findings. Section 6 concludes the paper.

2. Background

2.1. Low-income women's decision to open a bank account

Two leading views may explain women's financial exclusion. Some scholars argue that the barriers that limit access to banking services are higher for women than men because of taste-based or statistical discrimination of banks. According to this view, banks discriminate against female entrepreneurs even if they (i.e., banks) have to pay the price for that (e.g., Muravyev et al., 2009); that is, there is taste-based discrimination in the banking sector. An alternative view is that there is no supply-side discrimination in the banking sector; women in developing countries have limited demand for formal banking services (e.g., Baydas et al., 1994; Buvinic and Berger, 1990). Specifically, two factors explain the limited demand for formal banking services: (1) high costs of account opening and maintenance and (2) low levels of financial literacy (Cole et al., 2011).

Several scholars have found that reducing account opening costs increases low-income households' demand for bank accounts, although the magnitude of this impact varies across countries. For example, when account opening fees were removed, 84% households in Nepal opened an account (Prina, 2015). In response to similar incentives, the account opening rates were 54% in Uganda, 69% in Malawi, and 17% in Chile (Dupas et al., 2018). There are gender differences in account opening rates. For example, Dupas and Robinson (2013) conducted an RCT in Kenya. They found that when account opening fees were removed, women were more likely than men to open and use a bank account.

Scholars have also investigated the link between financial literacy and account opening decisions. For example, using data from >100 countries, Grohmann et al. (2018) have found that financial literacy is positively associated with account ownership and usage. Adetunji and David-West (2019) have used data on 22,000 Nigerian respondents and found similar evidence. However, extant evidence suggests that women are less financially literate than men and that this difference often translates into gender differences in the impact of financial literacy training (Lusardi and Mitchell, 2014). For example, Koomson et al. (2020) conducted an RCT in Ghana. They found that financial literacy training had a stronger impact on women's than men's decision to open a bank account. However, it had a stronger impact on men's than women's saving behaviors.

Extant evidence suggests that apart from price and knowledge, gender norms also significantly affect women's financial inclusion (Buvinić and O'Donnell, 2019; Demirgüç-Kunt et al., 2013). Women entrepreneurs in developing countries often refrain from applying for bank loans because gender relations deny them access to household resources, obstructing their ability to offer collateral. In some countries, for example, in certain parts of Pakistan, it is even illegal for women to borrow from a bank unless a male family member co-signs the loan. In many South Asian and Middle Eastern countries, women are reluctant to visit bank branches because cultural norms restrain them from moving freely without male family members (Yunus, 1999). A study by the Consultative Group to Assist the Poor (CGAP, 2020) reveals that women in southeastern Turkey are less likely than men to use formal banking services because a woman with an independent bank account is generally viewed with mistrust in that society. In fact, it is common among women and men in that region to believe that women do not need to save. Instead, as the family provider, it is the man's role to save, borrow, and manage household financial resources.

This evidence suggests that in traditional patriarchal societies, women's decision to open a bank account largely depends on the degree of men's control over female family members. While there are many pathways through which societal gender relations can affect women's decision to enter financial markets, we study the impact of an extreme form of male control – violence against women – on women's decision to open a bank account.

2.2. Exposure to IPV and low-income women's account opening decision

Several researchers have investigated whether access to community-based banking services reduces the incidence and severity of domestic violence. These studies have provided mixed evidence. For example, Bajracharya and Amin (2013), Chin (2012), and Schuler

[3] For a discussion on the link between financial development and economic growth, see Mishkin (2007). For theoretical discussion on how financial exclusion causes persistent income inequality and poverty traps, see Banerjee and Newman (1993), Galor and Zeira (1993), and Lahcen and Gomis-Porqueras (2021).

et al. (1996) all find that women's participation in microcredit programs reduces the likelihood of domestic violence. These findings are consistent with the theory of household bargaining, which predicts that women's financial independence reduces their likelihood of abuse by intimate partners (Aizer, 2010). Others have found that microcredit program participants are at a higher risk of abuse than non-participants (e.g., Bhuiya et al., 2003; Naved and Persson, 2005; Schuler et al., 1998). This finding of a higher risk of abuse is consistent with the male backlash theory, which proposes that women's financial independence challenges the patriarchal norm of male dominance. As a result, the challenged men might try to restore their authority by becoming more violent.

The present study differs from these studies because instead of investigating the impact of participation in credit programs on the likelihood of IPV, this study investigates whether experiencing such violence affects women's decision to enter financial markets by opening a savings account. However, there are many possible pathways explaining the link between IPV and financial inclusion, we focus on a behavioral pathway comprising two steps. First, exposure to IPV causes impulsivity, which increases the level of impatience and risk tolerance in women. Next, increased impatience and risk tolerance – caused by IPV – reduces the likelihood of account opening. Fig. 1 presents the proposed pathway.

2.2.1. *Exposure to IPV and impulsivity: Implications on risk- and time-preferences*

Clinical and population-based studies suggest that 20–75% of the victims of IPV suffer from permanent or temporary injuries (Ellsberg et al., 2008; Garcia-Moreno et al., 2006; Heise, 1998). They also report a variety of somatic complaints, such as chronic headaches, abdominal pains, muscle aches, dizziness, and eating and sleeping disorders. For most women, however, the psychological impact of domestic violence is more devastating than its physical impact. Women in violent relationships experience strong negative emotions, such as grief, anxiety, fear, anger, embarrassment, avoidance, and distraction (Campbell, 2002; Coker et al., 2002; Mullen et al., 1988). Due to the threat of recurring violence, they frequently recall unpleasant memories, which perpetuates the influence of these negative emotions (Campbell, 2002; Silva et al., 1997).

The literature on economic psychology suggests that when people experience physical pain or negative emotions—the two common health consequences of domestic violence—they focus attention on activities that can immediately reduce the intensity of pain and aversive emotions (Loewenstein, 1996 and Loewenstein, 2000). Narrowing attention causes impulsivity—a predisposition toward rash, unplanned actions without considering the negative consequences or long-term effects of these actions. Impulsivity influences human behavior in two important ways. First, impulsive people make short-sighted trade-offs between immediate and delayed rewards. Second, they display suboptimal behavioral patterns, such as excessive risk-taking without prudence. It is, therefore, possible that victims of domestic violence are more risk tolerant and more impatient compared to those who are not exposed to such violence.

2.2.2. *The link between time preferences and account opening decision*

An individual's choice between immediate and delayed rewards – known as time preferences – is a cognitive attribute that divides individuals and their actions into temporal frames (Frederick et al., 2002). For example, a present-oriented individual is more impatient than a future-oriented individual because the former is more likely to prefer immediate rewards over delayed rewards of larger size. Thus, present-oriented individuals have higher time discount rates because they discount future rewards at higher rates. Individuals with low time-discount rates (i.e., individuals with high patience) are more likely to save for the future (Epper et al., 2020; Finke and Huston, 2013), invest in higher education (Falk et al., 2018), and wait longer for suitable jobs when unemployed (DellaVigna and Paserman, 2005).

Time preferences are also linked with low-income women's account opening decision. Prior research suggests that even the poorest households in low- and middle-income countries have substantial slack in their budget (Banerjee and Duflo, 2007; Collins et al., 2009; Gugerty, 2007; Karlan et al., 2014). However, many do not save because there is often an enormous temptation to meet immediate

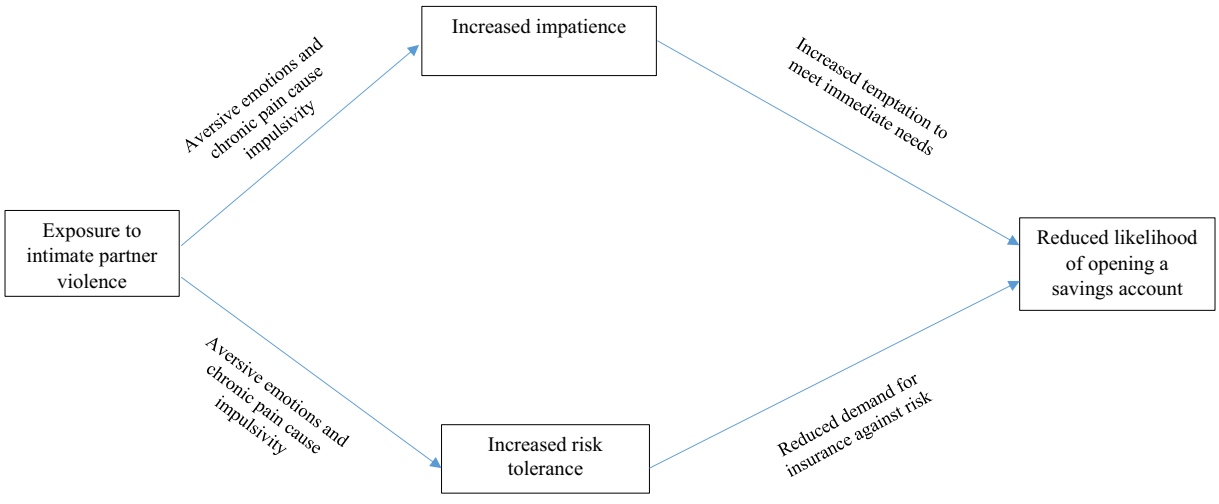

Fig. 1. Intimate partner violence, innate preferences, and the decision to open a savings account.

consumption needs in these households (see also Yunus, 1999). As such, self-control difficulties—related to the trade-off between current and future rewards—likely undermine their efforts to save and, consequently, their demand for a savings account. We, therefore, conjecture that exposure to IPV makes the women more impatient, which discourages them from opening a savings account. In other words, time preferences partially mediate (i.e., explain) the negative relationship between IPV and account opening decision.

2.2.3. The link between risk preferences and account opening decision

Risk preference is a psychological trait that explains differences in individuals' appetite for risk (Mata et al., 2018). Economic decisions, such as occupational choice (e.g., Cramer et al., 2002), investment and consumption choices (e.g., Dow and da Costa Werlang, 1992; Paravisini et al., 2017), or insurance coverage (Outreville, 2014) largely depend on individuals' risk preferences.

Risk preferences are also linked with low-income women's account opening decision. Research has shown that in the absence of formal insurance mechanisms, having a simple savings account helps poor households cope with shocks and vulnerability (Prina, 2015). As such, a woman's decision to open a savings account reflects her attitude toward risk. Specifically, less risk-averse women are less likely to open a bank account because they demand less insurance against risk. Indeed, Cameron and Manisha (2015) have found that risk-taking individuals are less likely to participate in community-based credit programs, which provide insurance against risk in rural communities of developing countries.

Based on this discussion, we conjecture that exposure to IPV makes low-income women more risk tolerant, reducing their demand for a savings account. In other words, risk preferences partially mediate the negative relationship between IPV and account opening decision.

3. The context

3.1. Women's financial exclusion in Bangladesh

According to the 2021 Global Findex Data, 47% of the adults in Bangladesh did not have an account with a formal financial institution, such as a bank, microfinance institution, credit union, post office, or a mobile financial service provider. Among women, the rate of financial exclusion was 54%. Financially excluded women were asked the reasons for not opening a bank account. Seventy nine percent of the women reported not having enough money as a reason. Twenty-nine percent of the unbanked women reported no need for financial services as one of the reasons for not having an account, 43% of the women reported that maintaining a bank account is prohibitively expensive, 33% reported distance as a reason they did not have an account, 24% reported they lacked trust in banks, 28% reported they lacked necessary documents, whereas 10% women did not open an account because of religious reasons. Another primary reason (23%) for not having an account was that "someone else in the family already has an account."

According to the World Bank's Women, Business and the Law Database, a woman in Bangladesh can open a bank account or register a business in the same way as a man. There is neither any legal discrimination against women's movement, nor any legal provisions that require a married woman to obey her husband. These rules had been in place since the country's independence in 1971. Yet, extant evidence suggests that married women often require their husbands' permission and support to enter formal financial markets (Kabeer, 2001, 2011; Singh, 2017). Indeed, many Bangladeshi women, who had taken loans from microcredit programs reported that they had no control over their loan proceeds (Goetz and Gupta, 1996; Kabeer, 2001). Gender norms also restrain women from visiting bank branches. Prior to founding the Grameen Bank in 1983, Muhammad Yunus tried to link a group of Bangladeshi women entrepreneurs to local banks so they could borrow working capital for their small businesses. He found that most of the women were reluctant to visit bank branches although they used to borrow from loan sharks at much higher costs (Yunus, 1999). Digital financial services might mitigate the mobility barriers but they require access to mobile phones and financial literacy.

3.2. The incidence and severity of domestic violence in Bangladesh

The incidence and severity of IPV are high in Bangladesh. In different studies, 16–37% of married women reported experiencing physical or sexual violence by their husbands in the last 12 months (e.g., Bates et al., 2004; Chin, 2012; Garcia-Moreno et al., 2006; Koenig et al., 2003; Naved and Persson, 2005; Schuler et al., 1996; Shahriar, 2016; Shahriar and Shepherd, 2019). A survey in 2015 found that >70% of currently married women experienced IPV in their lifetime (Bangladesh Bureau of Statistics, 2016). IPV in rural Bangladesh is linked to patriarchal gender norms that provide men with control over their female family members (Chin, 2012; Koenig et al., 2003; Roy et al., 2019; Schuler et al., 1998). The practice of female seclusion (i.e., *purdah*) restricts women from moving freely and participate in income-generating activities outside the home. They also have less control over household resources and limited participation in household decision-making. Marriage-related norms and practices further contribute to women's vulnerability (Bates et al., 2004). For example, many married men use violence as a bargaining tool to extort dowry (Bloch and Rao, 2002; Naved and Persson, 2005, 2010).

4. Data collection

4.1. Subject recruitment

We conducted this study in the *Maulavibazar* district of northeast Bangladesh. Forty percent of the district's workforce is involved in agriculture, 15% is self-employed in commerce and trading, and 13% of the workforce is involved in daily labor in non-agricultural

sectors (Asiatic Society of Bangladesh, 2023). We recruited subjects from seven *unions* of the district with the help of the members of the local union council.[4] We adopted several criteria for recruiting subjects. First, we recruited only married women of reproductive age (18–45 years).[5] Second, we considered women whose households owned <0.2 ha of cultivable land. The union council office maintains a list of such women because owning <0.2 ha of arable land (in addition to the land on which their house is built) is an eligibility criterion of different government-run social security programs, such as the Vulnerable Group Development. It is also an eligibility criterion for participation in major microcredit programs, such as the Grameen Bank. Third, we excluded women who do not have national identity cards because it is a required document for opening a bank account in Bangladesh.[6] We did not recruit more than one woman from the same household. We recruited 700 women—100 from each of the seven unions.

We collected data in several stages. Fig. 2 shows the timeline of data collection. First, we conducted a baseline survey with the 700 women. Next, we conducted laboratory experiments, post-experiment surveys, and a banking intervention with 446 women who did not have a bank account (i.e., financially excluded). Finally, we surveyed 148 women who opened a bank account following the banking intervention and collected information on their account usage.

4.2. Baseline survey

In the baseline survey, we used a survey questionnaire to interview the women at their homes. We collected information on a wide array of demographic and socioeconomic factors, such as a woman's age, education, household income and assets, personal savings, and exposure to non-violent shocks, such as natural disasters or the death of an earning member in the family. We asked questions on their primary occupation. Following the World Health Survey (2002), we collected information on a woman's self-reported health status and assessed it on a scale from 1 to 5, with lower numbers indicating poorer health.[7] We asked three questions from the General Social Survey (GSS) to measure a woman's perception of trust, fairness, and helpfulness. We measured a general social trust index as the number of positive answers to these questions. A higher value on this index implies a more trusting individual and vice versa. We further asked three questions to measure a woman's self-confidence, financial confidence, and the level of autonomy she enjoys in household decision-making.[8]

We collected information on financial literacy. Following Lusardi and Mitchell (2011, 2014), we identify three core areas of financial knowledge: namely, understanding of discounting, price and inflation, and the risk associated with diversification. We asked four questions to collect information on these dimensions.[9] We measure financial literacy on a scale from 0 to 4, with higher scores indicating better financial knowledge and vice versa.

We collected information on women's financial inclusion. We asked each woman whether she, by herself or with someone else, had an account at a formal financial institution, such as a bank, microfinance institution, mobile financial service provider, or post office. Following Allen et al. (2016), we categorize financially excluded women as those who do not have an account with a formal financial institution (see also De Jong et al., 2022).

We also interviewed each woman's husband using a short questionnaire. We collected information on their age, level of education, and employment. We asked them if they had witnessed—as children—domestic violence in their families.

In the baseline survey, 483 women reported that they did not have a formal bank account. We invited these unbanked women to participate in the experiments, of whom 446 participated. These unbanked women ($N = 446$) constituted our final sample. They first performed risk-elicitation and time-discounting tasks in a laboratory set-up. After that, we interviewed them to collect information on their IPV experience.[10] Finally, we introduced them to our partner bank and offered them an option to open an account without any fees.

[4] A union is a cluster of villages. A union council is the lowest form of local government in Bangladesh.

[5] A standard practice in domestic violence surveys is to recruit women of reproductive age (e.g., Garcia-Moreno et al., 2006; the Bangladesh Demographic Health Survey, 2011). Women of reproductive age include all women aged 15–44 or 15–49 years (World Health Organization, 2006).

[6] According to the 2017 Global Findex Report, 86% of the adult population in Bangladesh have national ID cards.

[7] We asked the women the following question: "In general, how would you rate your health today" with the possible choices being "very good" (5), "good" (4), "moderate" (3), "bad" (2), and "very bad" (1).

[8] GSS is conducted by the National Opinion Research Center and the University of Chicago—is used to collect data on the demographic characteristics and attitudes of residents of the United States. The three trust questions of this survey have been widely used in empirical research (e.g., Glaeser et al., 2000; Karlan, 2005), including studies conducted in rural Bangladesh (e.g., Shahriar et al., 2020). Specifically, we asked whether a woman believed that (1) people can generally always or almost always be trusted, (2) people try to be fair all or most of the time, and (3) people try to be helpful most of the time. The questions on self-confidence, financial confidence, and autonomy were adopted from Chin (2012) and Shahriar (2016). The exact wording of these questions can be found in Table 2.

[9] Specifically, we asked the women these questions: (1) "Suppose you borrow Taka 100 from a money lender at an interest rate of 2% per month with no repayment for three months. After three months, do you owe less than Taka 102, exactly Taka 102, or more than Taka 102?" (2) "Suppose you have Taka 1000 in a savings account earning 1% interest per annum. Prices for goods and services rise 2% over a one-year period. After one year, can you buy more than, less than, or the same amount of goods as you could today with the money in the account?" (3) "Is it riskier to plant multiple crops or one crop?" (4) "Suppose you need to borrow Taka 500. Two people offer you a loan. One loan requires you to pay back Taka 600 in one month. The second loan requires you to pay back Taka 500 in one month plus 15% interest per month. Which loan represents a better deal for you?"

[10] We avoided asking IPV questions in the baseline survey because, from our previous experience, we know that many women are not comfortable discussing their IPV experience at home.

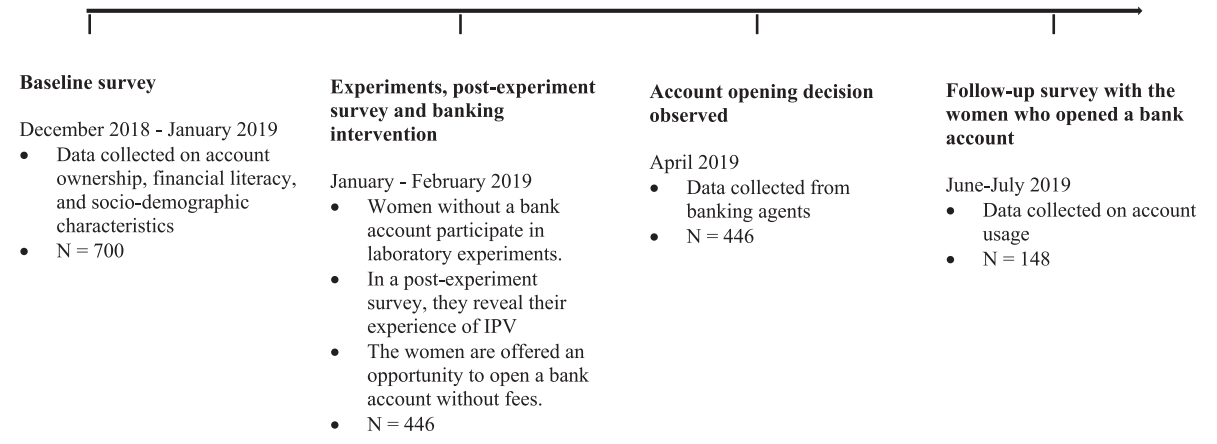

Fig. 2. Timeline of data collection.

4.3. Laboratory experiments

The women (N = 446) showed up at the experimental site (local school buildings) at a prespecified time. In odd-numbered sessions, they first played the risk-elicitation game. In even-numbered sessions, women first participated in the time-discounting task. The number of participants per experimental session varied between six and eight. Each subject received TK 300 for participation and earned additional monies depending on the choices she made during the course of the experiments.[11] The experimental protocols are described in the Appendix.

Upon arrival at the experimental site, subjects were directed to a large room, where we provided experimental instructions in Bangla, which is spoken and understood by all subjects. We asked subjects specific questions to ensure they understood the rules of the game. We also did a practice round. Once we were convinced that the subjects understood the rules of the game and the associated payoffs, we took each subject individually to a private room, where she participated in the risk-elicitation and time-discounting tasks. Thus, a subject's experimental decisions were not influenced by that of the other subjects in the same session. Experimenters and research assistants carefully avoided giving instructions about how to answer a question.

4.3.1. Risk-elicitation tasks

The protocol for the risk-elicitation tasks follows Harbaugh et al. (2002) and Voors et al. (2012). Compared to other established risk-elicitation tasks, such as the multiple price list procedure of Holt and Laury (2002), this experimental design has an advantage in that it is easy to comprehend for subjects with low levels of education.

In the risk-elicitation game, a woman performed a series of three tasks, each of which involved choosing between (a) receiving an amount of money with certainty and (b) participating in a gamble that offers TK 200 with probability 0.3, or nothing with probability 0.7. The expected value of the gamble was always the same (TK 60), but we varied the amount of money to be received with certainty across the three tasks. In particular, the certain bid was lower (TK 50), equal to (TK 60), and higher (TK 70) than the expected value of the gamble. These choices are presented in panel A of Table 1. As the value of the certain amount increased, the gamble became less attractive. The point at which a woman switched from the risky to the safe alternative allows us to determine her degree of risk aversion. Thus, the value of each woman's *risk tolerance* was measured on a scale from 0 to 3, where 0 indicates a risk-averse woman who chose a certain gain over the gamble in each of the three tasks and 3 indicates a risk-lover who chose to gamble every time.

After subjects completed all three tasks, we used a simple lottery to determine a pairwise choice. The option chosen for that pair determined how much money she received from the risk elicitation tasks. If she chose a certain amount of money from that pair, she was paid that amount at the end of the experimental session. If she chose the uncertain bid, she played a simple ball-drawing game to determine the outcome of the risk-elicitation task (see the Appendix).

4.3.2. Time discounting tasks

For time discounting tasks, we followed the protocol of Bauer et al. (2012) and Voors et al. (2012). Subjects were presented a series of eight tasks. Each task involved choosing between receiving money in the near future and receiving a larger sum at a later time. To avoid issues related to transaction costs and the uncertainty associated with receiving money in the future, we implemented a front-end delay of one day. Subjects chose between receiving TK 200 tomorrow and receiving TK 200 $(1 + d)$ in 15 days. We chose eight values of the discount rate, d, namely, 0.00, 0.01, 0.02, 0.05, 0.10, 0.40, 0.70, and 1.00. Thus, a woman could earn an additional TK 200 by waiting two weeks. See Panel B of Table 1. The smallest d for which she preferred delayed payment to earlier payment measures her

[11] Taka (TK) is the official currency of Bangladesh. In 2019, one US dollar was equivalent to TK 84. The daily per capita income in Bangladesh was TK 262.

Table 1
Risk-elicitation and time-discounting tasks: Choice pairs and summary of findings.

	Panel A: Choice pairs in risk-elicitation tasks		
	Certain bid	*Gamble*	
	Gain	Probability	Gain
Task 1	50	0.3	200
Task 2	60	0.3	200
Task 3	70	0.3	200

	Panel B: Choice pairs in time-discounting tasks		
	Payment received tomorrow	Payment received in 15 days	Discount rate, *d*
Task 1	200	200	0.00
Task 2	200	202	0.01
Task 3	200	204	0.02
Task 4	200	210	0.05
Task 5	200	220	0.10
Task 6	200	280	0.40
Task 7	200	340	0.70
Task 8	200	400	1.00

Panel C: Summary of findings			
	Women who experienced IPV in the last 12 months Mean (Standard Deviation)	Women who did not experience IPV in the last 12 months Mean (Standard Deviation)	Differences between abused and non-abused women t-statistic (absolute value)
Risk preference	1.70 (1.18)	1.23 (1.25)	3.44
Discount rates	28.06 (21.89)	18.15 (20.30)	4.14

current discount rate. A woman's *level of impatience* is measured by her time discount rate. A woman with high time discount rate (i.e., one who discounts the future payoff at high rates) is more impatient than a woman with low time discount rate.

Using a simple lottery, we determined one pairwise choice from the eight tasks presented to each subject, and the option chosen for that particular pair determined how much money she would receive and when.[12]

4.4. Information session and bank's intervention

We conducted an information session after the completion of the experimental tasks, in which we introduced the women to our partner bank—Dutch-Bangla Bank Limited (DBBL). In addition to conventional branch-based banking, DBBL provides basic banking services through retail agents in remote areas of the country.[13] We collaborated with seven banking agents of DBBL—one from each of the seven unions in which we conducted the study. These agents offered our subjects an option to open a savings account.

Having this account allows one to deposit and withdraw cash, transfer funds to other accounts (i.e., person to person or P2P transactions), and make utility and merchant payments from an agent point or branch office of the bank. The account can be used to receive funds, such as salary, remittances, and government allowance. There were no fees or charges involved for these transactions made at an agent point or a branch of the bank. The account holders have access to automatic teller machines (ATM). Account-holders receive an interest payment of 2% per year on the minimum monthly balance held in the account. The real return on savings, however, was negative because the average inflation rate in Bangladesh during the study period was >5%. The total cost of opening a savings account and maintaining it for up to two years was TK 355. We informed the women about how to open and use a bank account. Each woman then received a voucher. The voucher, which expired in three months, could be brought to a partner DBBL agent and redeemed for opening a savings account and use it for free for two years.

4.5. The post-experiment survey: questions on IPV

After the completion of the information session, we conducted a survey in which we asked the women questions about their experience of domestic violence. This survey was conducted following the ethical and safety guidelines recommended by the World Health Organization (2016). We hired married female interviewers so that the participants felt comfortable discussing their experiences. We made efforts to maintain privacy and safety by interviewing each woman *separately* in a private room. We assured the participants that their responses would remain confidential. We followed the guidelines provided by Jansen et al. (2004) to train the interviewers on how to address reactions to questions on domestic violence. We adopted a series of questions from the Demographic Health Survey's Domestic Violence Module, which have been widely used in prior research (e.g., Bajracharya and Amin, 2013; Chin, 2012; Kim et al., 2007; Pronyk et al., 2006; Shahriar, 2016; Shahriar and Shepherd, 2019). We asked a woman the following nine questions. Did your husband *ever* (1) push you, shake you, or throw something at you; (2) slap you or twist your arm; (3) punch you with his fist or with something that could hurt you; (4) kick you or drag you; (5) try to strangle you or burn you; (6) threaten you with a knife, gun, or other types of weapon; (7) attack you with a knife, gun, or other types of weapon; (8) physically force you to have sexual intercourse with him when you did not want to; and (9) force you to perform other sexual acts you did not want to? A woman who answered "yes" to any of these questions is considered having exposed to domestic violence in her lifetime. She was then asked about how often it had happened in the past 12 months. Those who answered "often" or "sometimes" to any of these questions are considered having exposed to IPV in the recent past.

We also collected information on a woman's attitude toward the acceptability of domestic violence in different circumstances. In particular, we asked a woman whether she believes that a husband is justified in beating his wife in any of these circumstances: (a) if she burns the food, (b) if she argues with him, (c) if she goes out without telling him, (d) if she neglects their children, or (e) if she refuses to have sexual intercourse with him. We adopted these questions from the Bangladesh Demographic Health Survey (2011). A woman who answered "yes" to any of these questions is considered to have an acceptance for domestic violence.

4.6. Follow-up survey

Unlike prior studies (e.g., Prina, 2015; Dupas et al., 2018, 2019), we do not have access to bank's administrative data on the women's account usage. Consequently, we conducted a follow-up survey to collect information on account usage. Six months after the banking intervention, we surveyed the women who opened an account with our partner banking agents. Of the 171 women who opened an account following the banking intervention, we could trace 148 women. We asked them whether they make a deposit or a withdrawal in a typical month. These simple questions on account usage have been adopted (and modified) from the 2014 Global Findex Survey Questionnaire.

[12] Each woman provided a mobile phone number at the subject-recruitment stage. Her earnings from the time-discounting tasks were transferred to the mobile phone as pre-paid talk time.

[13] A banking agent is the owner of an outlet who conducts banking transactions on behalf of a bank under a valid agency agreement (Bangladesh Bank, 2013).

4.7. Summary statistics

Table 2 presents summary statistics along with the definition of the variables used in our empirical analyses. Column A of Table 2 presents summary statistics for all the women in our sample. Column B presents summary statistics for the women who reported experiencing IPV in the last 12 months. Column C presents summary statistics for the women who did not experience such violence. Column D reports the t-statistics for these differences. Of all the women, 24% reported experiencing either physical or sexual violence by their husbands within the last 12 months.

The mean age of the participants was 32 years, and on average, they had spent five years in school. 70% of the women were involved in income-generating activities, such as farming (including homestead farming, animal rearing, and day labor in agriculture), self-employment (i.e., running small businesses, vending, trading), and salaried employment. On average, a woman had six members in her household. The average monthly income of a woman's household was Tk 6600, and the value of her household assets was Tk 0.77 million. An average woman in our sample had Tk 3500 of personal savings. The mean value of the financial literacy score was 1.87.[14] Of all the women, 21% reported that they experienced income shocks in the last 12 months because of natural disasters or the death of an earning member of the family. We did not find any significant differences in age, education, financial literacy, employment status, savings, or ownership of assets in the two subsamples (i.e., victims of spousal violence and non-victims). The mean value of the General Social Trust index was 1.79. We find that women who experienced IPV in the last 12 months are more trusting than others. That is, they are more likely to believe most people in the society can be trusted and that they are fair and benevolent.[15]

The average value of the self-reported health status was 2.47, indicating moderate to bad health on the day of the interview. Victims of IPV reported worse health status than the non-victims, which is consistent with the findings of prior studies on the health effects of IPV (e.g., Ellsberg et al., 2008). There are no significant differences among the victims and non-victims in terms of general or financial confidence. Of all the women, 29% reported that they were very confident in raising their opinion in public, whereas only 7% reported that they were confident to raise enough money in the event of a crisis. However, victims of IPV are significantly less likely to report that they enjoy autonomy in household decision-making (14% versus 29%), such as making small purchases, cooking food for the family, or visiting family members, relatives, or doctors without their husband's permission.

5. Results

5.1. Results of the lab experiments

Summary data from the experimental tasks are presented in Panel C of Table 1. A woman's risk preference is measured on a scale from 0 to 3, where 0 indicates a risk-averse woman and 3 indicates a risk-lover. The mean value of risk preference is significantly higher among those who experienced IPV than those who did not experience such violence in the recent past ($p < 0.01$). It implies that the victims of domestic violence are more risk tolerant than others. It further appears that the mean discount rate of the victims of IPV is significantly larger, which implies that they are more impatient because they are less likely to delay receiving money in the experimental tasks than those who did not experience domestic violence in the recent past.

To check whether such differences in risk- and time-preferences hold after controlling for observable characteristics, we conduct Ordinary Least Squares (OLS) regression. First, we regress risk tolerance on exposure to IPV and report the results in the first column of Table 3. The variable *IPV* equals one if a woman reported experiencing a violent act—either physical or sexual—by her husband in the last 12 months, and zero otherwise. We control for a woman's age, education, financial literacy, employment status, household income, household assets, size of the household, personal savings, household's exposure to income shocks, self-reported health status, and her time discount rate. We also control for a woman's general social trust and her levels of self-confidence, financial confidence, and autonomy. We control for village-fixed effects and measure robust standard errors. We observe a positive correlation between victimization and risk tolerance ($p < 0.01$). Next, we regress the level of impatience (i.e., time discount rates) on exposure to IPV after controlling for the same observable factors mentioned above and a woman's risk tolerance. We also control for village-fixed effects and measure robust standard errors. The results are reported in the second column of Table 3. We find a positive correlation between victimization and time discounting rates ($p < 0.01$), which suggests that victims of IPV require larger rewards for delaying gratification. Together, these findings suggest that women who experienced physical or sexual violence by their husbands in the last 12 months are more risk tolerant and more impatient than those who were not exposed to such violence. These findings are robust to including common controls and fixed effects.

We further find that age is correlated with preferences. Both risk tolerance and the level of impatience decline with age. Experiencing natural disasters or the death of an earning member of the family increases risk-aversion. This finding suggests that exposure to non-violent shocks does not produce the same responses as intimate partner violence on attitude toward risk. Finally, we find that women from wealthier households are less impatient. This finding is consistent with a growing literature suggesting that poverty can undermine the capacity for self-control—an important determinant of one's ability to delay gratification (e.g., Bernheim et al., 2015; Carvalho et al., 2016; Haushofer and Fehr, 2014).

[14] In response to similar survey questions in Cole et al.'s study (2011), the average financial literacy score was 1.38 in India and 2.1 in Indonesia.
[15] Prior research has shown that trusting behavior—measured by GSS questions—correlates with social preferences (Glaeser et al., 2000) and that individuals exposed to violence often display strong social preferences, such as altruism toward their neighbors (Voors et al., 2012).

Table 2
Summary Statistics.

Variables	Description	Column A All women Mean (Std) (N = 446)	Column B Women who experienced IPV in the last 12 months Mean (Std) (*N* = 106)	Column C Women who did not experience IPV in the last 12 months Mean (Std) (*N* = 340)	Column D Differences between Columns B and C t-statistic (absolute value)
Intimate partner violence (IPV)	1 if a woman reported experiencing physical or sexual violence by her husband in the last 12 months, 0 otherwise.	0.24 (0.43)			
Age	Age of a woman (Min: 18, Max: 45)	32.31 (7.50)	32.93 (7.17)	32.12 (7.60)	0.97
Education	Years of school attended by a woman (Min: 0, Max: 13)	4.65 (3.59)	4.71 (3.67)	4.63 (3.57)	0.20
Unemployed	1 if a woman is a housewife or unemployed, 0 otherwise.	0.30 (0.46)	0.31 (0.46)	0.29 (0.45)	0.34
Household size	Number of members in a woman's household (Min: 3, Max: 10)	6.18 (1.45)	6.20 (1.62)	6.18 (1.41)	0.13
Household assets	The value of a woman's household assets such as arable land, dwelling house, cattle, and other valuables (in thousand TK, Min: 100, Max: 2500).	770.54 (687.66)	783.53 (696.79)	728.87 (658.97)	0.71
Household income	Monthly income of a woman's household (in thousand TK, Min: 4, Max: 15)	6.59 (1.81)	6.61 (1.85)	6.53 (1.66)	0.41
Personal savings	Personal savings of a woman (in thousand TK, Min: 0, Max: 10)	3.54 (2.75)	3.53 (2.79)	3.60 (2.64)	0.25
Exposure to shocks	1 if a woman's household experienced shocks in the last 12 months, such as a natural disaster (flood, cyclone, or river erosion) or the death of an earning family member.	0.21 (0.40)	0.20 (0.40)	0.21 (0.41)	0.04
Health	Self-reported health status of a woman, a higher score indicating better health (Min: 1, Max:5)	2.47 (0.73)	2.31 (0.72)	2.45 (0.73)	1.71
General Social Trust	The number of positive answers to GSS trust questions (Min: 0, Max: 3)	1.79 (0.65)	1.91 (0.55)	1.75 (0.68)	2.23
Self confidence	1 if a woman answered "Very confident" to the following question, 0 otherwise. "If you were at a community meeting, how confident are you that you could raise your opinion in public?" (a) Very confident; (b) somewhat confident; (c) not confident at all.	0.29 (0.45)	0.23 (0.43)	0.31 (0.46)	1.44
Financial confidence	1 if a subject answered "Very confident" to the following question; 0 otherwise. "In the event of a crisis (e.g., house burn), how confident are you that you alone could raise enough money to feed your family for 4 weeks?" Very confident; (b) somewhat confident; (c) not confident at all.	0.07 (0.26)	0.07 (0.25)	0.07 (0.26)	0.26

(*continued on next page*)

Table 2 (*continued*)

Autonomy	1 if a subject answered "No" to at least three of these cases; 0 otherwise. "Do you need your husband's permission (a) To make small household purchases? (b) To visit a doctor? (c) To take children to the doctor? (d) To visit family or relatives? (e) To cook food for the family?	0.26 (0.44)	0.14 (0.35)	0.29 (0.45)	3.16
Financial literacy	A woman's level of financial literacy (Min: 1, Max: 4)	1.87 (0.94)	1.85 (9.42)	1.89 (0.94)	0.25
Distance from bank	Distance between a woman's household and the nearest partner banking agent (in kilometers, Min: 4, Max: 10)	6.79 (1.24)	6.78 (1.41)	6.79 (1.19)	0.06
Take-up of bank account	1 if a woman opened a bank account, 0 otherwise	0.38 (0.48)	0.19 (0.39)	0.46 (0.50)	5.34

Table 3
Correlates of innate preferences and account opening decision.

	Dependent Variable: Risk tolerance	Dependent Variable: Time discounting rate	Dependent Variable: Take-up of bank accounts	Dependent Variable: Take-up of bank accounts
IPV	0.454***	7.345***	−0.244***	−0.172***
	(0.146)	(2.696)	(0.048)	(0.050)
Age	−0.024***	−0.367**	−0.002	−0.003
	(0.008)	(0.145)	(0.003)	(0.003)
Education	−0.015	0.410	0.001	0.001
	(0.017)	(0.263)	(0.007)	(0.007)
Unemployed	−0.020	2.664	−0.014	−0.011
	(0.124)	(2.335)	(0.049)	(0.050)
Household size	0.030	−0.241	−0.008	−0.006
	(0.041)	(0.710)	(0.016)	(0.016)
ln *(Household assets)*	0.086	−1.965**	−0.011	−0.014
	(0.064)	(1.008)	(0.023)	(0.024)
Household monthly income	−0.029	−0.080	0.027**	0.024**
	(0.029)	(0.551)	(0.012)	(0.012)
Personal savings of woman	−0.020	−0.206	0.017**	0.017**
	(0.020)	(0.343)	(0.008)	(0.009)
Exposure to shocks	−0.368***	3.460	−0.081	−0.105*
	(0.141)	(2.373)	(0.057)	(0.059)
Self-reported health status	0.083	0.738	0.025	0.028
	(0.084)	(1.422)	(0.032)	(0.032)
General social trust	−0.066	−2.387	0.075**	0.072**
	(0.092)	(1.498)	(0.035)	(0.036)
Financial literacy	0.001	−0.947	0.088***	0.082***
	(0.062)	(1.060)	(0.025)	(0.025)
Self-confidence	−0.080	1.782	0.057	0.066
	(0.122)	(2.114)	(0.051)	(0.051)
Financial confidence	−0.087	1.496	0.186**	0.191**
	(0.250)	(3.436)	(0.079)	(0.081)
Autonomy	−0.133	3.256	0.063	0.094*
	(0.144)	(2.438)	(0.054)	(0.056)
Risk tolerance		5.178***		−0.039**
		(0.812)		(0.019)
Discount rate	0.019***			−0.003***
	(0.003)			(0.001)
Distance from bank			0.022	0.013
			(0.019)	(0.019)
Constant	1.258**	15.952	−0.142	0.088
	(0.582)	(10.175)	(0.260)	(0.266)
Village-fixed effects	Yes	Yes	Yes	Yes
Observations	408	408	430	408
R-squared	0.189	0.180	0.139	0.180

Notes: Risk tolerance is measured on a scale from 0 to 3. A higher value indicates more risk-seeking behavior. Time discount rate has eight discrete values and ranges between 0 and 100. A higher value indicates more impatience. *Take-up of bank account* equals one if a woman opened a bank account, zero otherwise. *IPV* equals one if a woman reported experiencing intimate partner violence in the last 12 months, zero otherwise. Control variables are described in Table 2. Results are based on either OLS regression (Columns 1 and 2) or LPM (Columns 3 and 4). Robust standard errors are in brackets. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

5.2. Take-up of bank accounts

The mean values of account-opening rates are reported in Table 2. It appears that there are significant differences in these rates among the women who experienced IPV in the recent past and those who did not experience such violence. Of all the women, 38% opened a bank account within three months of receiving the voucher, which waived the account opening and maintenance fees. The account-opening rate among the victims of IPV is 19%. Among those who did not experience IPV, the take-up rate of a bank account is 46%. This difference is statistically significant at the 1% level.

We examine the impact of IPV on account opening using regression analysis. We define *take-up* of account as a binary variable that equals one if a woman opened an account at our partner bank within three months of receiving the voucher and zero otherwise. First, we regress *take-up* on *IPV* using a linear probability model (LPM) and report the results in the third column of Table 3. We control for a woman's age, education, financial literacy, employment, household income, household assets, size of the household, personal savings, exposure to income shocks, self-reported health status, general social trust, self-confidence, financial confidence, and autonomy. We control for village-fixed effects and measure robust standard errors. We find that victims of domestic violence are 24 percentage points less likely to open a bank account than those who were not exposed to IPV in the last 12 months ($p < 0.01$). We check whether this

finding is robust to the inclusion of a woman's risk tolerance and time-discount rates as control variables. The results—reported in the fourth column of Table 3—suggest that the coefficient of IPV is still statistically significant at the 1% level, although its magnitude declines substantially after controlling for the effects of innate preferences.

We further find that both risk tolerance and time-discount rates are significantly associated with account opening rates. The likelihood of account opening declines with a woman's time discount rates. As mentioned in the introduction, one of the reasons why poor women fail to save is that they face enormous temptation to fulfill current consumption needs. It is, thus, not surprising that women with higher discount rates (i.e., those who are more likely to be tempted) have less demand for a savings account. In a randomized controlled experiment in the Philippines, Ashraf et al. (2006) find that present biased women (i.e., those who are less patient at present than in the future) are less likely to open a commitment savings account (i.e., an account that does not allow the account holder to withdraw money until a goal date or amount is reached) than those with consistent time preferences. We offered our subjects a simple savings account with no commitment feature. We find that those who are more impatient at present are less likely to open such an account. We also find that risk-taking is negatively associated with account opening decisions. Having a bank account helps poor women cope with shocks, and thus, provides insurance in the absence of formal insurance markets (Prina, 2015). Thus, our findings imply that less risk-averse women have less demand for insurance, which is reflected in their account opening decision.

Our findings further suggest that the amounts of personal savings and monthly household income are positively correlated with the take-up rate. The level of financial confidence of a woman is positively correlated with her account-opening decision. More trusting women are more likely to open a bank account. Autonomy is moderately positively, while non-violent shock is moderately negatively associated with the account-opening decision. Finally, we find that financial literacy is positively correlated with account opening decision. This finding is consistent with prior studies discussed above (e.g., Adetunji and David-West, 2019; Grohmann et al., 2018).

5.3. Robustness checks

There are two identification problems, which may affect the validity of our results. First, some unobserved factors may simultaneously explain victimization, innate preferences, and account opening decisions. Second, the estimated coefficients in Table 3 may suffer from reporting bias because under-reporting of spousal violence is common in IPV research (Chin, 2012; Koenig et al., 2003). To address these concerns, we conducted two robustness tests, the results of which are discussed below.

5.3.1. Exposure to IPV, innate preferences, and account opening decision in a matched subsample

One way to address selection bias in the absence of a randomized trial is to consider a sample of subjects in which everyone has a similar likelihood of receiving the treatment, but only one group had received it, and the other had not. The mean outcome difference between these two groups is less likely to suffer from selection bias (Khandker et al., 2010; Stuart, 2010). Following Shahriar (2016), we consider a subsample of women based on this principle.

As mentioned in Section 4.5, we asked each woman if she believed a husband is justified in beating his wife under different circumstances, for example, if she burns the food, if she argues with him, if she goes out without telling him, if she neglects their children, or if she refuses to have sexual intercourse with him. In this section, we take a subsample of women who answered "yes" to any of these questions. Women who believe IPV is "justified" or "normal" under certain circumstances are highly likely to enter and remain in violent relationships (Chin, 2012; Garcia-Moreno et al., 2006; Jewkes et al., 2002). Thus, for example, the account opening decision of a woman who believes IPV is normal but did not experience such violence serves as a proxy of account opening decision of a victim of IPV had she not been victimized (i.e., the counterfactual). Regression coefficients estimated from this sample are, therefore, less likely to suffer from selection bias. Furthermore, women who believe IPV is acceptable are less likely to underreport violent acts by their husbands (Shahriar, 2016).

A total of 194 subjects (44%) reported that a husband is justified in beating his wife. We regress risk tolerance on exposure to IPV for this subsample using OLS and report the results in the first column of Table 4. As before, we control for a woman's age, education,

Table 4
Correlates of innate preferences and account opening decision: Subsample of women who believe IPV is normal.

	Dependent Variable: Risk tolerance	Dependent Variable: Time discounting rate	Dependent Variable: Take-up of bank accounts
IPV	0.641***	6.789***	−0.228***
	(0.090)	(2.216)	(0.072)
Controlled for observable factors	Yes	Yes	Yes
Controlled for risk tolerance		Yes	No
Controlled for time discounting	Yes		No
Village-fixed effects	Yes	Yes	Yes
Observations	179	179	179
R-squared	0.29	0.25	0.20

Notes: Risk tolerance is measured on a scale from 0 to 3. A higher value indicates more risk-seeking behavior. Time discount rate has eight discrete values and ranges between 0 and 100. A higher value indicates more impatience. *Take-up of bank account* equals one if a woman opened a bank account, zero otherwise. *IPV* equals one if a woman reported experiencing intimate partner violence in the last 12 months, zero otherwise. Control variables are described in Table 2. Results are based on either OLS regression (Columns 1 and 2) or LPM (Column 3). Robust standard errors are in brackets. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

employment, household income, household assets, size of the household, personal savings, household's exposure to income shocks, self-reported health status, time discount rate, general social trust, self-confidence, financial confidence, and autonomy. We control for village-fixed effects and measure robust standard errors. We observe a significant positive correlation between victimization and risk-taking in this subsample ($p < 0.01$). Next, we regress time discount rates on exposure to IPV after controlling for the same observable factors and a woman's risk tolerance (the second column of Table 4). Again, we find a significant positive correlation between victimization and time discount rates ($p < 0.01$). Finally, we regress *take-up* on *IPV* using a linear probability model. The results reported in the third column of Table 4 suggest that there is a significant negative correlation between IPV and account opening decisions ($p < 0.01$).

5.3.2. Instrumental variables test

In this section, we conduct an instrumental variables (IV) estimation. A valid instrument is correlated with a woman's exposure to IPV but does not affect her innate preferences or account opening decisions directly except through her violence experience. We consider whether a woman's husband had witnessed domestic violence as a child as an IV. Children who witness violence between adults in their homes—also known as the "silent," "forgotten," or "unintended" victims of domestic violence—report childhood problems associated with behavioral, emotional, and cognitive functioning and attitudes (for a review, see Dauvergne and Johnson, 2001; Edleson, 1999). Social learning theory (Bandura, 1977, 1978) suggests that children who witness violence learn to use it. As a result, they are more likely to be aggressive than other children. Several researchers have found that abusive spouses are much more likely to have violent family backgrounds (e.g., Bowlus and Seitz, 2006; Straus et al., 2013). There is, however, no evidence to suggest that a man's witnessing violence in childhood directly affects his wife's innate preferences or her decision to open a bank account except through his violent acts.

As mentioned in Section 4.2, we interviewed each woman's husband while conducting the baseline survey. We asked them if they had witnessed—as children—domestic violence in their families. We create a binary variable, *husband witnessing IPV,* which equals one if a woman's husband answered yes to that question. In the first-stage regression, we examine the determinants of a woman's risk of IPV. The results—reported in the first column of Table 5—suggest that women whose husbands witnessed domestic violence as a child are significantly more likely to experience spousal violence.

Next, we apply an IV-2SLS technique and regress risk tolerance and time discount rates on women's exposure to IPV using *husband witnessing IPV* as an IV. We add all the control variables introduced in Table 3. We control for village-fixed effects and measure robust standard errors. The results are reported, respectively, in the second and third columns of Table 5. We find that IPV has significant positive correlations with both risk tolerance and time discount rates when instrumented by *husband witnessing IPV* ($p < 0.01$).

Next, we regress women's account opening decisions on their exposure to IPV using *husband witnessing IPV* as an IV. First, we add all the control variables except for innate preferences (the fourth column of Table 5), and then we add innate preferences as control variables (the fifth column of Table 5). We find a significant negative correlation between IPV and bank account opening in both specifications ($p < 0.01$), although the magnitude of the coefficient of IPV declines substantially when we add innate preferences as control variables. These findings are consistent with what we reported in Table 3.

Together, based on the results of the robustness check, it can be reasonably augured that the observed effects of IPV on innate preferences and account opening decisions are unlikely to be driven by non-random selection into victimization or a reporting bias.

5.4. Impact of IPV on account opening decision: The mediating role of risk tolerance and impatience

In this section, we test whether the impact of IPV on account opening decision is mediated by increased risk tolerance and impatience of the victims of IPV. According to Baron and Kenny (1986), a mediation-effect is supported if three conditions hold: (a) the treatment variable (i.e., exposure to IPV) has a significant relationship with both the mediator (i.e., risk tolerance and impatience) and the outcome (i.e., account opening decision), (b) the relationship between the mediator and the outcome is significant, and (c) after statistically controlling for the mediator, a previously significant relationship between the treatment and the outcome is substantially weakened.

In Sections 5.1 and 5.2, we show that women who experienced IPV in the recent past are more risk tolerant and more impatient and that they are less likely to open a bank account than those who did not experience such violence. We show that both risk tolerance and time discount rates are significantly associated with account opening decisions. Specifically, more risk-taking and more impatient women are less likely to open a bank account. We further show that when we regress account opening decisions on IPV, the magnitude of the negative effect of IPV substantially declines after adding innate preferences as control variables. These findings hold when we apply IV-2SLS regression using husband's witnessing IPV in childhood as an IV. Thus, we find support for all the three conditions of a mediation effect, which implies that exposure to IPV increases the women's risk tolerance and level of impatience, both of which reduces the likelihood of account opening.

A limitation of Baron and Kenny (1986) hierarchical regression analysis is that it does not allow us to measure the relative importance of the direct effect of IPV on account opening decisions and its indirect effect through risk- and time-preferences. We, therefore, conduct a path analysis to assess these effects. In path analysis, the effect of a predictor variable, x, on the outcome variable, y, is decomposed into two parts (Wright, 1934; Pevzner et al., 2015). The first part measures the direct effect of x on y. The second part is mediated by a control variable, z – also known as the indirect effect of x on y. In this study, we empirically test whether and to what extent exposure to IPV has indirect effects on account opening decisions through increased risk tolerance and impatience. While there are many ways of measuring indirect effects, we used a Karlson-Holm-Breen (KHB) test, which is an appropriate framework for assessing path analysis involving a dichotomous dependent variable (e.g., account opening decision) and more than one mediator (e.g.,

Table 5
Correlates of innate preferences and account opening decision: Results of IV-2SLS regression.

	Results of first stage regression	Results of second stage regression			
	Dependent variable: exposure to IPV	Dependent Variable: Risk tolerance	Dependent Variable: Time discounting rate	Dependent Variable: Take-up of accounts	Dependent Variable: Take-up of accounts
IPV		0.720***	6.815***	−0.439***	−0.312**
		(0.189)	(2.006)	(0.131)	(0.152)
Age	0.008	−0.028***	−0.312**	−0.001	−0.002
	(0.006)	(0.009)	(0.140)	(0.003)	(0.003)
Education	0.006	−0.017	0.369	0.001	0.001
	(0.007)	(0.018)	(0.277)	(0.007)	(0.007)
Unemployed	0.016	−0.015	2.601	−0.013	−0.012
	(0.041)	(0.138)	(2.148)	(0.050)	(0.050)
Household size	0.014	0.023	−0.264	−0.008	−0.006
	(0.014)	(0.043)	(0.675)	(0.016)	(0.016)
ln (Household assets)	−0.030	0.114*	−2.639**	−0.017	−0.017
	(0.021)	(0.065)	(1.023)	(0.024)	(0.024)
Household monthly income	−0.009	−0.026	−0.073	0.026**	0.024*
	(0.009)	(0.034)	(0.527)	(0.013)	(0.012)
Personal savings	0.002	−0.024	−0.240	0.017**	0.018**
	(0.006)	(0.023)	(0.354)	(0.008)	(0.008)
Exposure to shocks	0.028	−0.369**	3.139	−0.078	−0.102*
	(0.047)	(0.154)	(2.419)	(0.056)	(0.056)
Self-reported health status	−0.036**	0.134	1.147	0.016	0.022
	(0.016)	(0.089)	(1.391)	(0.032)	(0.033)
General social trust	0.059**	−0.143	−2.923*	0.087**	0.081**
	(0.025)	(0.100)	(1.549)	(0.035)	(0.037)
Financial literacy	−0.002	−0.010	−0.989	0.088***	0.083***
	(0.021)	(0.068)	(1.048)	(0.024)	(0.025)
Self-confidence	−0.061	0.008	2.336	0.045	0.057
	(0.042)	(0.139)	(2.147)	(0.050)	(0.050)
Financial confidence	0.001	−0.004	2.021	0.197**	0.200**
	(0.069)	(0.254)	(3.953)	(0.093)	(0.092)
Autonomy	−0.127***	0.082	4.684*	0.031	0.072
	(0.039)	(0.159)	(2.435)	(0.056)	(0.058)
Risk tolerance			4.468***		−0.030**
			(0.911)		(0.011)
Discount rate		0.013***			−0.003**
		(0.003)			(0.001)
Distance from bank				0.024	0.015
				(0.019)	(0.019)
Husband's age	−0.003				
	(0.006)				
Husband's education	0.005				
	(0.007)				
Husband unemployed	0.197***				
	(0.064)				
Husband witnessing IPV	0.176***				
	(0.056)				
Constant	0.033	1.078*	14.797	−0.105	0.082
	(0.180)	(0.639)	(9.952)	(0.259)	(0.266)
Village-fixed effects	Yes	Yes	Yes	Yes	Yes

(*continued on next page*)

Table 5 (*continued*)

	Results of first stage regression	Results of second stage regression			
	Dependent variable: exposure to IPV	Dependent Variable: Risk tolerance	Dependent Variable: Time discounting rate	Dependent Variable: Take-up of accounts	Dependent Variable: Take-up of accounts
Observations	430	408	408	430	408
R-squared	0.179	0.124	0.147	0.112	0.167

Notes: IPV equals one if a woman reported experiencing intimate partner violence in the last 12 months, zero otherwise. Risk tolerance is measured on a scale from 0 to 3. A higher value indicates more risk-seeking behavior. Time discount rate has eight discrete values and ranges between 0 and 100. A higher value indicates more impatience. *Take-up of bank account* equals one if a woman opened a bank account, zero otherwise. Control variables are described in Table 2. Results of the first-stage regression are based on probit model. Results of the second stage are based on IV-2SLS using *husband witnessing violence* as IV. Robust standard errors are in brackets. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

risk tolerance and impatience) (Breen et al., 2013; Karlson et al., 2012; Kohler et al., 2011; Christiansen et al., 2016; Shahriar and Shepherd, 2019).

The results of the path analysis are reported in Table 6. In Panel A, we decompose the total effect of IPV on account opening decision into direct effect and indirect effects through increased risk tolerance and impatience. The first column shows the magnitude of the direct and indirect effects along with their standard errors, and the second column reports the *Z*-statistics developed by Karlson et al. (2012).

The total effect of IPV on account opening decision ($\beta = -0.249$, $p < 0.01$) is negative and statistically significant. The direct effect of IPV – after controlling for the effects of risk tolerance and impatience – is also negative and statistically significant ($\beta = -0.184$, $p < 0.01$). These findings imply that on average, the probability of account opening decreases by 25 percentage points for a standard-deviation increase in the probability of being exposed to IPV. After controlling for the effects of risk tolerance and impatience, this average decline is reduced to 18.4 percentage points.

The indirect effect of IPV through increased risk tolerance ($\beta = -0.026$, $p < 0.05$) is negative and statistically significant. This finding implies that a standard-deviation increase in the probability of being exposed to IPV leads to increased risk tolerance, which is then translated into a lower likelihood of account opening of 2.6 percentage points. Finally, the indirect effect of IPV through increased impatience ($\beta = -0.039$, $p < 0.05$) is also negative and statistically significant. Thus, a standard-deviation increase in the probability of being exposed to IPV leads to increased impatience, which is then translated into a lower likelihood of account opening of 3.9 percentage points.

Overall, 26% of the effects of IPV on account opening decision is mediated by increased risk tolerance and impatience. Thus, the link between IPV and low-income women's decision to open a bank account is significantly and substantially mediated by increased risk tolerance and impatience of the victims of the IPV.

We check whether these findings hold in a matched subsample. In Panel B of Table 6, we report the results of the KHB test for the subsample of women who believe IPV is acceptable under certain circumstances. The total ($\beta = -0.229$, $p < 0.01$) and direct ($\beta = -0.145$, $p < 0.01$) effects of IPV on account opening decisions are both negative and statistically significant. Thus, in the matched subsample, the probability of account opening decreases, on average, by 23 percentage points for a standard-deviation increase in the probability of being exposed to IPV. After controlling for the effects of risk tolerance and impatience, this average decline is reduced to

Table 6
Results of path analysis: decomposing the effect of IPV on account opening decision.

	Panel A: All women		Panel B: Women who believe IPV is normal under certain circumstances	
	Coefficients and standard errors estimated from probit model	Z	Coefficients and standard errors estimated from probit model	Z
Total effect	−0.249 (0.054)	−4.63	−0.229 (0.059)	−3.86
Direct effect	−0.184 (0.057)	−3.22	−0.145 (0.068)	−2.12
Indirect effects via increases risk tolerance	−0.026 (0.013)	−1.96	−0.024 (0.012)	−2.03
Indirect effect via increased impatience	−0.039 (0.015)	−2.61	−0.060 (0.027)	−2.21
Contribution of each mediator to the total effect				
Risk tolerance	10.36%		10.43%	
Time discount rate (level of impatience)	15.86%		26.09%	
Contribution of each mediator to the indirect effect				
Risk tolerance	39.53%		28.55%	
Time discount rate (level of impatience)	60.47%		71.45%	

14.5 percentage points. Indirect effects of IPV through increased risk tolerance ($\beta = -0.024$, $p < 0.05$) and increased impatience ($\beta = -0.060$, $p < 0.05$) are both negative and statistically significant. A standard-deviation increase in the probability of being exposed to IPV leads to increased risk tolerance, which is then translated into a lower likelihood of account opening of 2.4 percentage points. Similarly, a standard-deviation increase in the probability of being exposed to IPV leads to increased impatience, which is then translated into a lower likelihood of account opening of 6 percentage points. Overall, 36% of the effects of IPV in this sample is explained by increased risk tolerance and impatience of the victims of IPV. Thus, the mediating effects of risk- and time-preferences are robust.

5.5. Additional findings: Is there a link between IPV and account usage?

Financial inclusion encompasses both access to and use of financial services. In this section, we check whether victims of IPV have different propensities of account usage compared to that of the non-victims. In the follow-up survey, we interviewed the women who opened a bank account following our banking intervention. We asked them: "In a typical month, is money deposited to (or withdrawn from) your savings account?" We introduce a binary variable, *deposit (withdrawal),* which equals one if a woman answered positively to this question and zero otherwise. We regressed *deposit (withdrawal)* on IPV using a probit model. We controlled for the effects of the socio-economic and demographic characteristics listed in Table 3. We also controlled for village-fixed effects. The marginal effects – reported in Columns A and B of Table 7 – suggest that the victims of IPV are less likely to use their bank accounts than those who did not experience such violence. Specifically, women experiencing IPV were 47% less likely to report that they make a deposit to their bank account in a typical month ($p < 0.01$). Furthermore, the victims of IPV were 40% less likely to report that they make a withdrawal from their bank account in a typical month ($p < 0.01$).

5.6. Corroborative evidence: Can these results be generalized?

In this section, we check whether our main findings – women experiencing IPV are less likely to open a bank account vis-à-vis those without such experience – can be generalized. For this, we collected cross-country data from two sources. First, from the UN Women Global Database on Violence against Women, we collected information on the proportion of ever-partnered women and girls subjected to physical and/or sexual violence by a current or former intimate partner in the previous 12 months. We collected this data for 2018 – the latest year on which this information is available. Next, we collected country-specific data on financial exclusion from the World Bank's Global Findex Database. We collected information on the percentage of adult women in a country who do not have an account with a formal financial institution, such as a bank, credit union, post office, or microfinance institution. The Global Findex is a triennial data. We collected data on country-level financial exclusion for the year 2020 from the 2021-version of this database. However, since account ownership is almost universal in developed countries, we limit this exercise to low- and middle-income countries. Specifically, we have data for both IPV and financial exclusion for 85 countries from Asia and the Pacific, Eastern Europe, Africa and the Middle East, and Latin America and the Caribbean.

Fig. 3 presents the scatter plot of the two variables. It is clearly evident that there is a positive correlation: In countries with high incidence of IPV, more women are financially excluded. This finding suggests that our results are not specific to particular country or region.

6. Conclusion

Enhancing women's participation in the formal financial market is one of the major development challenges in low-income countries (Buvinić and O'Donnell, 2019; Demirgüç-Kunt et al., 2013; Hess et al., 2021). We investigate whether there is any link between IPV—the most pervasive form of gender-based discrimination—and women's financial inclusion. There has been a growing recognition in the literature that experiencing IPV undermines a woman's ability to participate in economic activities, such as labor market participation, including self-employment (Shahriar and Shepherd, 2019; International Labour Office, 2018; United Nations, 2015; World Health Organization, 2013). We hypothesize that experiencing IPV also obstructs women from participating in financial

Table 7
IPV and account usage.

	Dependent Variable: Make a deposit in a typical month	Dependent Variable: Make a withdrawal in a typical month
	Marginal effects based on probit model	Marginal effects based on probit model
IPV	−0.476***	−0.402***
	(0.147)	(0.058)
Controlled for observable factors	Yes	Yes
Village-fixed effects	Yes	Yes
Observations	148	148
Pseudo R-squared	0.23	0.32
Wald chi-squared (prob > chi-squared)	33.99 (0.085)	63.66 (0.00)

Notes: Results are based on probit model. *IPV* equals one if a woman reported experiencing intimate partner violence in the last 12 months, zero otherwise. Control variables are described in Table 2. Robust standard errors are in parentheses. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

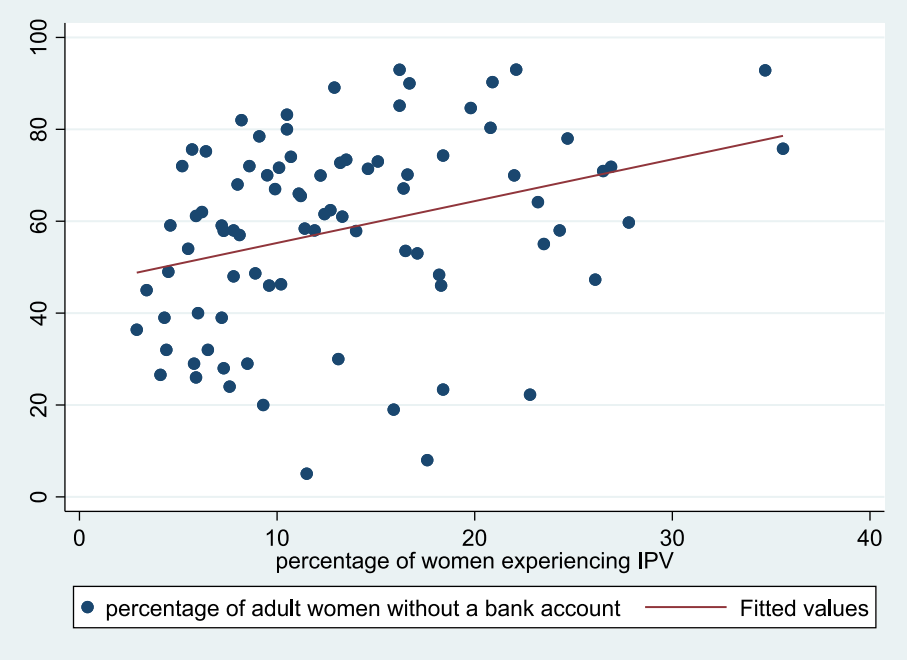

Fig. 3. Correlation between the incidence of IPV and financial exclusion.
This scatter plot is based on evidence from 85 countries: Afghanistan, Albania, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Chile, China, Colombia, Comoros, Costa Rica, Democratic Republic of the Congo, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Georgia, Ghana, Guatemala, Guinea, Guyana, Haiti, Honduras, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lao People's Democratic Republic, Lesotho, Liberia, Malawi, Mali, Mexico, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Rwanda, Senegal, Sierra Leone, South Africa, Sri Lanka, Sudan, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Uganda, Uruguay, Venezuela, Viet Nam, Zambia, and Zimbabwe.

markets by opening a bank account. Based on prior studies on economic psychology, we further hypothesize that the negative impact of IPV on women's financial inclusion is largely explained by increased risk tolerance and impatience.

We test these hypotheses in rural Bangladesh. A group of married unbanked women participated in laboratory-based experiments. We find that those who experienced spousal violence in the recent past are more risk-seeking and more impatient than others. All these women were offered an option to open a bank account without any account opening or maintenance fees for up to two years. We find that victims of domestic violence are significantly less likely to respond to such incentives and open a bank account. We conduct robustness checks—including an IV estimation—and confirm that these findings are unlikely to be explained by unobserved heterogeneity or non-random reporting bias. Finally, the results of causal mediation tests suggest that increased risk tolerance and impatience – caused by exposure to IPV – explain much of the negative effects of IPV on women's account opening decisions. Our findings imply that reducing gender-based violence will help increase women's participation in formal financial markets.

CRediT authorship contribution statement

Abu Zafar M. Shahriar: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Quamrul Alam:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

Declaration of competing interest

None.

Appendix A. Appendix

A.1. Experimental instructions and protocol

(General instructions. Read loudly by the experimenter at the beginning of a session to all participants.)
Good afternoon everyone. Thanks for taking the time to come today. We would like you to participate in some simple decision-

making tasks. Each time, I will offer you two options. Your task will be to choose one of these two options. Note that based on the decisions you will make in these activities, you can earn up to 600 Taka. So, please take your time and think deeply before making a decision. You are not allowed to talk to anyone. If you have any questions, please raise your hand and you will be personally attended to. You will now go to another room, where we will give you more information about the activities.

A.2. Risk-elicitation task

(One woman is seated with an experimenter. Each pair is separated from the others by space and partition.)

You can see a non-transparent jar here. There are 3 green balls and 7 red balls in the jar. You will pick one ball from the jar without looking at it. If you pick a green ball, I will give you 200 Taka. If you pick a red ball, I will not give you any money.

If you don't want to play this game, I will give you a certain amount of money for sure. Your task is to decide whether you will play the ball-drawing game or take the certain amount of money. I will ask for your decision three times.

Task 1. If you don't want to play the ball-drawing game, I will give you 50 Taka. Do you want to play the ball-drawing game or you want 50 Taka for sure?

(Woman reveals her choice. Experimenter records.)

Task 2. If you don't want to play the ball-drawing game, I will give you 60 Taka. Do you want to play the ball-drawing game or you want 60 Taka for sure?

(Woman reveals her choice. Experimenter records.)

Task 3. If you don't want to play the ball-drawing game, I will give you 70 Taka. Do you want to play the ball-drawing game or you want 70 Taka for sure?

(Woman reveals her choice. Experimenter records.)

At this stage, I will use a lottery to select a pairwise choice to be executed for actual payment. Suppose Task 1 has been selected in the lottery. In this case, if you decided—in Task 1—to play the ball-drawing game, I will play the game with you. If you pick a green ball, I will give you 200 Taka. If you pick a red ball, I will not give you any money. On the other hand, if you chose a certain amount of money in Task 1, I will give you 50 Taka for sure. You will receive your earnings from this phase before leaving the experimental site today.

(Using a simple lottery, experimenter selects a pairwise choice. If the woman chose a certain amount from that pair, she was paid that amount. If the woman chose the uncertain bid, she played the ball-drawing game. If she drew a green ball, she received Taka 200, otherwise she received nothing.)

A.3. Time-discounting task

(One woman is seated with an experimenter. Each pair is separated from the others by space and partition.)

In this task, you will be asked 8 questions. Each time, I will offer you two options. Your task will be to choose one of these two options.

1. What do you choose?
a. To receive 200 Taka tomorrow.
b. To receive 200 Taka in 15 days.
Woman reveals her choice. Experimenter records.
2. What do you choose?
a. To receive 200 Taka tomorrow.
b. To receive 202 Taka in 15 days.
Woman reveals her choice. Experimenter records.
3. What do you choose?
a. To receive 200 Taka tomorrow.
b. To receive 204 Taka in 15 days.
Woman reveals her choice. Experimenter records.
4. What do you choose?
a. To receive 200 Taka tomorrow.
b. To receive 210 Taka in 15 days.
Woman reveals her choice. Experimenter records.
5. What do you choose?
a. To receive Taka 200 tomorrow.
b. To receive Taka 220 in 15 days.
Woman reveals her choice. Experimenter records.
6. What do you choose?
a. To receive 200 Taka tomorrow.
b. To receive 280 Taka in 15 days.
Woman reveals her choice. Experimenter records.
7. What do you choose?
a. To receive 200 Taka tomorrow.

b. To receive 340 Taka in 15 days.

Woman reveals her choice. Experimenter records.

8. What do you choose?

a. To receive 200 Taka tomorrow.

b. To receive 400 Taka in 15 days.

Woman reveals her choice. Experimenter records.

At this stage, I will use a lottery to select a pairwise choice to be executed for actual payment. For example, suppose choice 5 has been selected in the lottery. In that case, if you preferred receiving 200 Taka tomorrow you will be paid 200 Taka tomorrow. On the other hand, if you preferred receiving 220 Taka in 15 days, you will receive 220 Taka in 15 days. You gave us a mobile phone number. Money will be transferred to that mobile phone as pre-paid talk time.

(Using a simple lottery, experimenter selects a pairwise choice. Depending on the woman's preference in that round, money was transferred to her mobile phone).

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