The Effect of Violent Crime on Intra-household Resource Allocation and Bargaining Power

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Abstract

This paper studies the effects of violent crime on household expenditures and intra-household bargaining power by exploiting the unexpected and geographically heterogeneous rise in drug-related violence in Mexico in the late 2000s. I estimate a household demand model using a panel survey of Mexican households. The results show the escalation in violence increased the expenditure share of male private goods, at the expense of food and other household necessities. These findings would typically be interpreted as a deterioration in women's bargaining power. But changes in local violence may have also affected consumption preferences. To show that the results can be explained by changes in bargaining power, I complement the analysis with three empirical exercises. First, I show the results are heterogeneous in line with changes in women's outside options. Second, I compute the effect of violence on intra-household resource shares, a proxy for bargaining power, within a structural model that allows for violence to affect both preference and bargaining power parameters. The structural analysis confirms the negative impact on women's control over the household budget. Finally, an estimation of changes in self-reported decision-making power further confirms the findings.

JEL Classification Numbers: D13, J12, J16, K42, I31

Keywords: crime, Mexico, Engel curves, women's bargaining power, resource shares

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1 Introduction

Exposure to violence is a pervasive and growing development challenge. In 2017, 220 million people lived in close proximity to conflict areas, twice as many as 10 years before (Corral et al. 2020). The threat goes beyond armed conflicts. Homicide, rape, or kidnapping are "everyday crimes" in many parts of the world. Crime reduction has not always gone hand in hand with economic growth. For instance, the economy grew in the majority of the Latin America and Caribbean region between 2000 and 2015. But as poverty rates fell and human capital increased, the crime rate rose (Jaitman 2017). In the US, about 47 people are still murdered every day (Abt 2019). Global economic shocks, climate change, and rising income inequality can all trigger new surges in violence.

The effects of violence are numerous and complex, and we should not expect them to be gender neutral (Buvinic et al. 2013). Changes in crime and victimization often have gender-differentiated impacts on labor, marital outcomes, and fear of victimization. Increases in local violence may therefore exacerbate gender inequalities inside the household. A large body of research has provided substantial evidence showing how shocks that worsen an individual's capacity to contribute to the household, as well as their options outside of marriage affect their intra-household bargaining power (Chiappori and Mazzocco 2017). These gendered impacts can have important policy implications. Women's intra-household bargaining power, defined as their capacity to negotiate or determine the allocation of a household's resources, commonly affects consumption allocations, and it is positively associated with women's and children's well-being (Doss 2013; Baland and Ziparo 2017).

In the late 2000s, Mexico experienced an unprecedented and unanticipated surge in drug-related crime. I exploit this quasi-experimental, geographical and temporal variation to estimate causal impacts of violent crime on households' behavior. In particular, this paper studies the effects of exposure to community violence on households' total expenditure, expenditure allocations, and the distribution of intra-household bargaining power.

I use data from the Mexican Family Life Survey (MxFLS), a rich longitudinal survey that has information on the same households before and after the escalation in crime. The timing and longitudinal structure of the MxFLS surveys allow to control for unobserved time-invariant household heterogeneity, and to account for behavioral responses such as non-random migration or household composition. Other researchers have used these data to estimate causal effects of the rise in Mexican drug-related crime on several outcomes.[1]

I estimate a system of household demand equations using an approximation to the Almost Ideal Demand System (Deaton and Muellbauer 1980). The demand equations are linear on the logarithm of total expenditure and local violence, measured by the homicide rate at the municipality level. The equations also include time-variant controls and household fixed effects. I also control for unobserved prices including location-time dummies. I test the linear functional form of the controls implementing Double-Lasso, a semi-parametric estimation of a data-driven partially linear model (Belloni et al. 2016).

I find that the increase in violence affected the composition of household expenditures. The results suggest increases in homicides shifted downward the household Engel curves of food and other necessities (hygiene and personal care items), while increasing the share of household expenditures allocated to private male clothing and gambling. Statistical evidence also shows households increased their transportation and health budget shares. A household living in a non-violent municipality prior to the escalation in homicides, who then experienced the average increase in crime, decreased the share of total expenditure allocated to food by 2.26 percentage points, and to hygiene and other household necessities by 0.84 percentage points. In contrast, the budget share of adult male clothing increased by 0.47 percentage points.

The coefficient of interest in the demand equations is the local violence variable.

[1] Previous studies have documented impacts of the Mexican drug war on labor force participation (Velasquez 2019), youth education (Brown and Velasquez 2017), birth outcomes (Brown 2018), risk preferences (Brown et al. 2018), and female decision-making power (Tsaneva, Rockmore, and Albohmood 2018). In terms of geographic representativeness of the increase in violence in Mexico, Velasquez (2019) documents non statistically significant differences in the change in violence across MxFLS and non-MxFLS municipalities.

But I first show the increase in violence did not affect total household expenditure. This null effect alleviates concerns of misspecification bias due to the linearity assumption of the log of total expenditure. In addition, I address the potential endogeneity of total expenditure due to recall, or measurement error bias. The coefficients on total expenditure are consistent with previous findings. Food is a necessity, as theoretically predicted by Engel's law. Hygiene and other personal care goods are also estimated to be necessities.

The reported impacts on consumption allocations are consistent with a deterioration in women's bargaining power. Previous research in Mexico and other developing countries has shown that improvements in women's control over the budget increases household expenditure on food and women's private goods (Bobonis 2009; Attanasio and Lechene 2010). Heterogeneous effects are also in line with changes in women's outside options and bargaining power. The negative effect on the food budget share is not present among women who worked more hours after the increase in violence. The positive impact on male clothing expenditure is twice as large when wives report being more afraid of crime victimization, and is not present when women worked more than before. Additionally, crime had a positive effect on the consumption of drinks and tobacco—more consumed by Mexican men than women—among women that become more scared of being attacked in the street.

But previous work linking women's bargaining power and intra-household allocations has mostly relied on *distribution factors*. These are variables that are assumed to alter bargaining power but not preferences, for example, changes in family law and individual cash transfers (Chiappori and Mazzocco 2017, Bobonis 2009, Attanasio and Lechene 2014). Admittedly, this assumption is stronger in the context of a large increase in community violence. To address this concern, I provide further empirical evidence of changes in intra-household bargaining power being an important mechanism explaining the effects on consumption allocations.

I compute the effect of violence on women's bargaining power through the estimation of intra-household resource shares, defined as the fraction of the total household budget individuals privately consume, within a structural model. The results suggest that, in households who experienced the average increase in crime over the period, women's resource shares decreased by approximately 5 percentage points. I allow the local homicide rate to affect both resource shares and preference parameters. I assume a collective model of the household with limited commitment (Chiappori and Mazzocco 2017), and I adapt the methodology proposed by Dunbar, Lewbel, and Pendakur (2013) to control for households' unobserved heterogeneity in a panel data setting. Identification of the resource shares derives from the slope of the Engel curves of men's and women's private assignable goods. Under standard utility assumptions, resource shares have a one-to-one relationship with Pareto weights.

Finally, I find that an increase in crime negatively affected standard measures of female decision-making. It lowered the probability that a woman would self-report as a decision-maker for the following household purchases: food eaten in the household, her clothing, her husband's clothing, and large expenditures. Concurrently, women become more likely to say their spouse is the one who makes such decisions. Importantly, I also find a positive effect of crime on men saying they, and not their spouses, make decisions regarding their own clothing, consistent with changes in bargaining power driving the expenditure increase in male goods, at the expense of household necessities.

Estimating causal effects of violent crime on households' outcomes requires addressing concerns over potential sources of omitted variable bias. The identification strategy relies on observing the same households before and after an unexpected escalation in local violence. The structure of the survey allows to account for households' migration behavioral responses in response to the increase in crime. I implement an "intent-to-treat" approach, where I assign the municipality of residence prior to the escalation in violence to all survey rounds. I also find no statistical evidence of non-random attrition.

The main threat to identification would be that the heterogeneous geographic and sharp temporal variation in homicides reported in Mexico was actually anticipated or was correlated with other underlying trends related to households' consumption patterns. To address these concerns, the main specification also controls for many time-varying characteristics, and I demonstrate the results are consistent throughout multiple robustness checks. These checks include, but are not restricted to, implementing double-lasso, the inclusion of potential municipality-level confounders, a placebo exercise to test for unobserved municipality trends using a prior survey wave, and randomization-based inference.

Further robustness checks include ruling out alternative mechanisms driving the results on consumption expenditures. I find no statistical evidence suggesting the results are explained by changes in household composition, local prices, home production allocations, households' standards of living, or male labor supply.

Contribution to the literature This paper contributes to several strands of the literature. The findings add to the understanding of the effects of exposure to violent crime on household's behavior and well-being. Disentangling selection from causal mechanisms has been a major challenge because crime can generally not be treated as randomly assigned. Households self-select their place of residence, and panel data have not commonly been available in such settings. This paper directly addresses these challenges.

I add to the literature on gender-differentiated effects of community violence. Understanding such gendered effects are key for effective policy design. Treatment effects may be heterogeneous by women's exposure to violence. For instance, Buehren et al. (2017) find that a randomized vocational and life skills training in South Sudan was only effective for girls not previously exposed to violent conflict. The male scarcity induced by wars and other armed conflicts had adverse effects on women's marital outcomes in places like France after World War I (Abramitzky, Delavande, and Vasconcelos 2011), and Russia after World War II (Brainerd 2017). La Mattina (2017) finds that women who married after the Rwandan genocide experienced greater domestic violence and reduced decision-making power.

Importantly, I add to the scarce, but rising, literature on gender-differentiated effects of crime and fear of victimization. The majority of research estimating causal impacts of community violence has focused on the consequences of armed conflicts, such as international or civil wars. Borker (2017) finds that women in India are willing to go to lower-quality colleges if the commuting routes are safer, whereas men are not. Recent randomized control trials that provide bicycles to girls have shown promising results in increasing female education, with both safety and time being relevant mechanisms (Muralidharan and Prakash 2017; Fiala et al. 2020).

The results specifically add to the literature on gender-differentiated impacts of drug-related crime. In a companion paper, Hernandez-de Benito (2020) examines the effect of violent crime on marriage markets during the Mexican drug war. The results suggest increases in violence have decreased women's age of marriage, increased marital age gaps, and altered divorce dynamics. Both a low age of marriage and large age gaps have been associated in multiple settings with a variety of negative outcomes for women, such as domestic violence, worse maternal health, and less educational investment (Field and Ambrus 2008; Jensen and Thornton 2003).[2] Velasquez (2019) and Dell (2015) show the increase in drug-related crime in Mexico has lowered women's labor force participation. Calderon, Gafaro, and Ibanez (2011) find that positive effects on labor outcomes among conflict-displaced women in Colombia did not translate into higher bargaining power or lower domestic violence. Millan-Quijano (2015) find that increases in homicides in Colombia increase the probability of early motherhood. Evidence exists of gendered impacts of exposure to homicides on education as well, with boys experiencing a larger negative effect on human capital accumulation in Mexico and Brazil (Brown and Velasquez 2017; Koppensteiner and Menezes 2020).

The results also contribute to the literature on the determinants of intra-household allocation of resources and bargaining power. Extensive research has been conducted on the importance of women's control over household budgets on consumption allocations, and women's and children's well-being (Baland and Ziparo 2017; Doss 2013). Previous research has mostly focused on the effects of exogenous shocks that

[2]In Hernandez-de Benito (2020), I use data from the Mexican 2000 and 2010 censuses to analyze the effect on marital status by gender and age cohort. Second, I use marriage-and divorce-level data obtained from the whole universe of marriage certificates collected by the Mexican Civil Registration Office to study changes in assortative matching and divorce proceedings.

presumably shifts bargaining parameters, but not preferences (Bobonis 2009; Attanasio and Lechene 2010; Armand et al. 2020). This paper discusses theoretically the necessary conditions for the results to be consistent with changes in bargaining power, and provides multiple empirical evidence of such mechanism.

I also add to the growing literature on the structural estimation of the determinants of intra-household resource allocation and women's intra-household bargaining power within a collective model of the household. This model of the household first introduced and developed by Chiappori (1992) and Bourguignon et al. (1993) has been used extensively in the literature. The key to the model is to assume household decisions are Pareto efficient. Although evidence is mixed on whether this assumption is reasonable in developing countries generally (Udry 1996), the work by Attanasio and Lechene (2014) and Bobonis (2009) fail to reject the efficiency assumption for Mexican families (at least within the PROGRESA cash-transfers recipients). I estimate women's resource shares within the household as a proxy for bargaining power. Identification relies on the presence of private assignable goods, and I use the methodology developed by Browning, Chiappori, and Lewbel (2013) and Dunbar, Lewbel, and Pendakur (2013). Other work has used this methodology to explain the phenomenon of elderly missing women in India (Calvi 2020), the effect of a cash-conditional-transfer program in Mexico (Sokullu and Valente 2018), or the introduction of unilateral divorce in Mexico (Penglase 2018).

The next section describes the background of the increase in drug-related crime in Mexico. Section 3 discusses the theoretical framework. Section 4 details the empirical strategy and discusses the results on household expenditures. In section 5, I explore the effect on women's intra-household resource shares and decision-making power. Finally, section 6 concludes.

2 Background

Mexico experienced a sudden, unanticipated, and large increase in violent crime starting in 2007. The homicide rate in the country almost tripled within five years. The increase in homicides per capita was so drastic it surpassed countries in the midst of armed conflicts at the time, such as Iraq and Afghanistan.[3] In 2019, the homicide rate reached a new record of 35 per 100,000 people.

This rise in violence was driven by an increase in drug-related crime. Estimates show over 50,000 people were killed between 2007 and 2010 due to drug-related violence. Figure 1 plots the annual homicide rate and a "drug-related" homicide rate over time. The latter counts deaths directly attributable to members of the cartels killing each other or resulting from confrontation with armed forces.[4]

Extensive research has studied the drivers of this rapid spike in violence. The most accepted hypothesis is that the surge in violence was an unintended consequence of the war on drugs initiated by the Mexican government. Within weeks of President Felipe Calderon's election in December 2006, the federal government deployed thousands of troops to fight drug-trafficking organizations (DTOs). The government combined its militarized approach with a "kingpin strategy" of arresting the leaders of the main drug cartels. The number of DTOs skyrocketed, and violence both escalated and spread geographically as drug leaders fought for territorial control.[5] Figure 2 shows the sharp and large increase in the average number of DTOs per Mexican municipality and the increase in the share of municipalities with DTO presence over time. Beyond President Calderon's war on drugs, previous research has identified other risk factors for the increase in homicides including scarcity in cocaine markets, manufacturing job loss, agricultural price shocks, and income inequality.[6]

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[3]Source: Global Peace Index 2016, Institute for Economics and Peace.

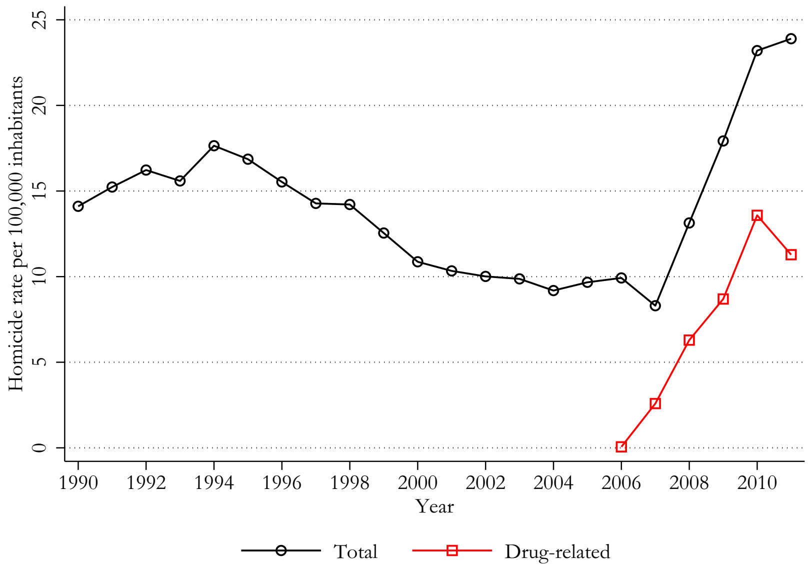
[4]Sources: INEGI, Office of the Mexican Attorney General, CONAPO.

[5]Dell (2015) uses a regression discontinuity design to show how a subsequent, larger increase occurred in the homicide rate in the municipalities where Calderon's political party won mayoral elections. Calderon et al. (2015) and Lindo and Padilla-Romo (2018) both show how the captures or killings of drug kingpins and lieutenants brought destabilizing effects through the cartels and were accompanied by escalations in homicides.

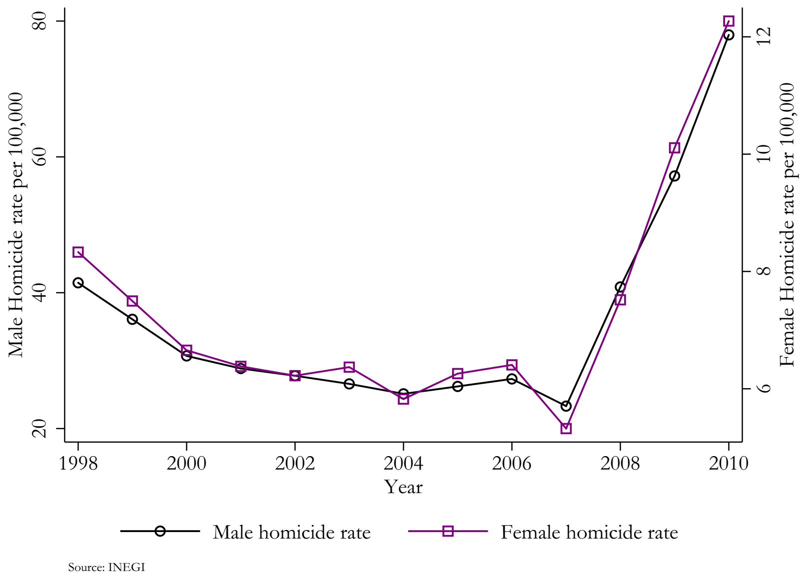
[6]Castillo, Meja, and Restrepo (2018) document how market scarcity induced by cocaine seizures in Colombia also increased violence in Mexico. Dell, Feigenberg, and Teshima (2019) show how municipalities that experience greater manufacturing job loss due to Chinese competition have greater cocaine trafficking and violence. Dube, Garcia-Ponce, and Thom (2016) show that lower maize prices differentially increased the cultivation of marijuana and opium poppies in climatically better-suited municipalities. Enamorado et al. (2016) find that increments in the municipality Gini

Figure 1: Annual Homicide Rate per 100,000 People

(a) Homicide Rate and Drug-Related Homicide Rate



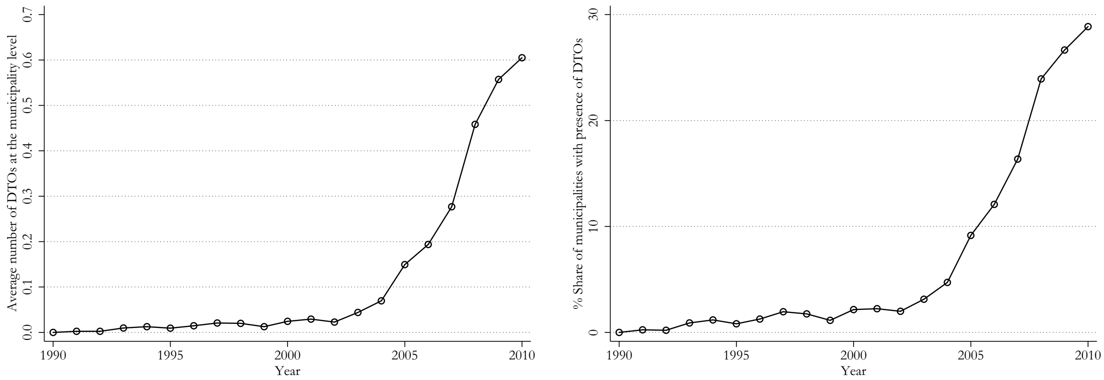
(b) 15-39 Male and Female Homicide Rate per 100,000 People



Sources: INEGI, Office of the Mexican Attorney General, CONAPO. Notes: Figure 1a plots the Mexican annual homicide rate over time (black line), and a "drug-related" homicide rate based on data compiled by the government, which counts deaths that can be directly linked to cartel members killing each other or resulting from confrontation with military and police forces (red line). Figure 1b plots the homicide rate of 15 to 39 year old men (black line) and women (purple line).

Figure 2: Expansion of Drug-Trafficking Organizations

(a) Number of DTOs per Municipality (b) % of Municipalities with DTOs



Source: Coscia and Ríos (2012). Notes: Figure 2a plots the average number of DTOs per municipality over time. Figure 2a plots the proportion of municipalities with at least one DTO over time.

The increase in drug-related violence was geographically heterogeneous. Whereas in some municipalities, the homicide rate was multiplied by 30, others continued to witness a decline in crime rates. Figure 3 maps the homicide rate at the municipality level in 2005 and 2012. In 2007, violence was concentrated in a few municipalities along the border with the US and the states of Sinaloa and Michoacan, the two main drug-producing states and home to the powerful Sinaloa and Michoacan Family cartels.[7] By 2012, violence had spread to many new municipalities that had become attractive routes of drug trafficking (Dell 2015; Calderon et al. 2015).

The majority of the homicides have been perpetrated against adult men. But the female homicide rate also doubled from 2007 to 2010 (Figure 1b). Descriptive evidence suggests that the risk of victimization is substantially higher among single women than among married women across age cohorts. This differentiated risk of victimization by marital status is greater for women than it is for men.

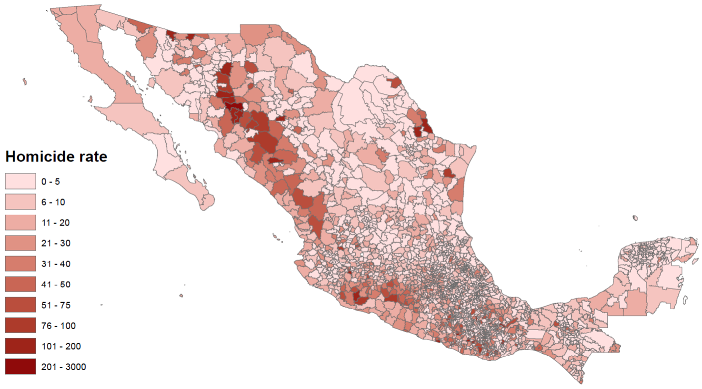
The large increments in drug-related violence go beyond homicides. Mexican civilians have been exposed to a much higher prevalence of other crimes as well, including

coefficient increases drug-related homicides.

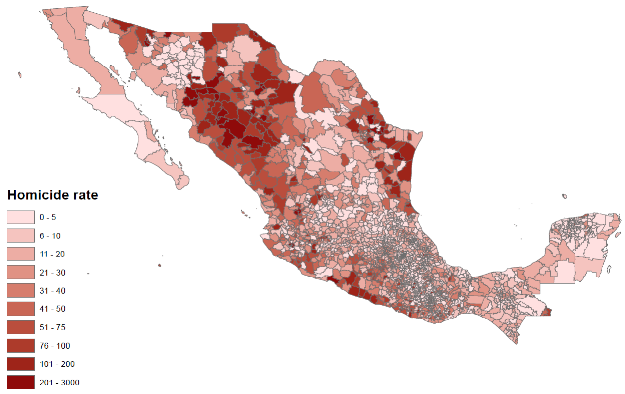
[7]The Sinaloa cartel has been commonly declared as the most powerful cartel in the world and is infamously known for its leader "El Chapo."

Figure 3: Annual Homicide Rates at the Municipality Level (per 100,000 People)

(a) 2005



(b) 2012



Notes: Annual homicide rates at the municipality level (per 100,000) in 2005 and 2012.

extortion, kidnapping, rape, and human trafficking (Calderon et al. 2015; Magaloni et al. 2020). Recent literature has shown negative impacts on economic activity (Robles, Calderon, and Magaloni 2013), young male educational investment (Brown and Velasquez 2017), individual risk aversion (Brown et al. 2018), newborns' birth weight (Brown 2018), mental health (Balmori de la Miyar 2014), and displacement effects (Orozco-Aleman and Gonzalez-Lozano 2018; Basu and Pearlman 2017).

Importantly, previous research has documented gendered effects of the Mexican drug war on fear of victimization and labor force participation. Mexican municipalities exposed to a higher drug-conflict intensity have experienced decreases in female labor supply—both among self-employed women and blue collar workers (Dell 2015;Utar 2018; Velasquez 2019). Velasquez (2019) shows the effect is much stronger among women who become more afraid of being attacked outside the household. Tsaneva, Rockmore, and Albohmood (2018) show a reduction in women's participation in household decision-making. Qualitative evidence on the so-called "narco-culture" also suggests that social norms may be at play involving stagnation or regression on attitudes toward women's place in the economy and inside the household (Kim 2014, Garcia 2011).

3 Theoretical Framework

The direct and indirect effects of violent crime can affect intra-household dynamics at every stage of the marital life. The potential impacts on individuals' outside options and preferences may influence when and whom you marry, how marriage's surplus is distributed across household members, and if or when you get divorced. In this paper, I study married households that were formed prior to the escalation in violence. Hence, I abstract from presenting a model of marital formation. I focus on the intra-household allocation of goods for already formed marriages.

3.1 A Collective Model of the Household

I assume households consist of two adult decision-makers, a wife w and a husband h. Households consume K different goods with market prices $p = (p^1, ..., p^k)$. Let z be the K-vector of goods consumed by the household, and let y be the total expenditure incurred by the household.

A consumption technology transforms households' consumption into individuals' consumption. Given a household consumption bundle z, a private good equivalent vector x_i exists for each household member, such that $z = F(x_w + x_h)$. In the absence of economies of scale, z would be equal to the sum of the private equivalent consumptions $x_w + x_h$. Consumption sharing and the presence of public goods suggests, however, this assumption is plausibly unrealistic. Instead, I assume *à la* Barten linear consumption technology $z = A'(x_w + x_h)$, a standard approach in the literature (Browning, Chiappori, and Lewbel 2013; Dunbar, Lewbel, and Pendakur

2013; Calvi 2020).[8]

I assume a collective model of the household that allows each individual to have their own utility function, and there is Pareto efficiency within each period. The collective model has been tested empirically in Mexico exploiting exogenous variation from the PROGRESA conditional cash transfer. Attanasio and Lechene (2014) and Bobonis (2009) both fail to reject efficiency of household consumption decisions.

The utility functions of the wife and the husband are monotonically increasing in consumption, twice continuously differentiable, and strictly quasi-concave. Let $U_i(x_i)$ be the sub-utility of individual i over the vector of goods x_i.[9] The efficiency assumption implies the household's maximization problem can be characterized by the weighted sum of the individuals' utility functions. Let $\mu(p, y)$ and $(1 - \mu(p, y))$ be the Pareto weights for the wife and the husband.

Both preferences and Pareto weights are allowed to depend on individuals' sociodemographic characteristics (e.g., age, education, community characteristics) but will be suppressed to simplify notation in this section.

At each period, households solve the following problem:

$$\max_{\{x_w, x_h, z\}} \mu(p, y)\ U_w(x_w) + (1 - \mu(p, y))\ U_h(x_h) \tag{1}$$

subject to a budget constraint:

$$p'z \leq y \tag{2}$$

and the consumption technology constraint:

$$z = A'(x_w + x_h). \tag{3}$$

Let $\tilde{p}^k = A^k p^k$. The first-order conditions imply:

[8] A is a $K \times K$ matrix such that $x_w + x_h = A^{-1}z$. This technology allows for different levels of jointness of consumption rather than categorizing goods as either private or public. Suppose the two members of the household always watch TV streaming services together. Then, the consumption of streaming services in private good equivalents is 2 times the purchased quantity at the household level. Assuming the consumption of streaming services does not depend on consumption of other goods, $z^k = \frac{1}{2}(x_w^k + x_h^k)$.

[9] Individuals may exhibit caring preferences meaning their overall utility may depend on other household members' utilities as well, but the utility function would be assumed to be weakly separable over the subutility functions for the consumption goods.

$$\frac{\mu(p,y)}{(1-\mu(p,y))} = \left(\frac{\partial U_h/\partial x_h^k}{\partial U_w/\partial x_w^j}\right)\left(\frac{\tilde{p}^j}{\tilde{p}^k}\right), \quad \forall k, j = 1, ..., K. \tag{4}$$

By the second welfare theorem, any Pareto efficient allocation can be supported as an equilibrium after transfers within household members. Define $\eta(p,y)$ as the *resource share* of the wife. The maximization problem in equation (1) is equivalent to an economy in which each individual i maximizes her private utility U^i subject to a vector of shadow prices $A'p$ and a shadow income of $\eta(p,y)y$ for the wife, and $(1-\eta(p,y))y$ for the husband. The first-order conditions from the wife's and the husband's individual problems, the envelope theorem, and equation (4) imply:

$$\frac{\lambda_h}{\lambda_w} = \left(\frac{\partial U_h/\partial x_h^k}{\partial U_w/\partial x_w^j}\right)\left(\frac{\tilde{p}^j}{\tilde{p}^k}\right) \quad \forall k, j = 1, ..., K \tag{5}$$

$$\frac{\mu(p,y)}{(1-\mu(p,y))} = \frac{\partial V^h(A'p,(1-\eta(p,y)y)}{\partial(1-\eta(p,y)y)} \bigg/ \frac{\partial V^w(A'p,\eta(p,y)y)}{\partial \eta(p,y)y} \tag{6}$$

where λ_i is the Lagrangian multiplier from individual i's maximization problem, and V_i is the indirect utility function of individual i. Equation (6) shows a one-to-one relationship between the Pareto weights and the resource shares (see Browning, Chiappori, and Lewbel (2013) for the full proof).

3.2 Intertemporal Limited Commitment

Generalization toward a dynamic model depends on the assumptions about households' capacity to commit intertemporally. I assume an intertemporal collective model with limited commitment (Mazzocco 2007, Chiappori and Mazzocco 2017). Households are assumed to fully cooperate in each period to achieve *within-period* Pareto efficiency, but cannot commit to the allocation of resources for every future period and possible state of nature.

Assuming limited commitment, the distribution of bargaining power can shift over time (μ_t) and marriages can end. In each period, in addition to the budget and consumption technology constraints, households are subject to the wife's and husband's participation constraints. Participation constraints will depend on each partner's option outside of the marriage. Marital breakup occurs when there is no feasible arrangement that makes both partners better off staying together. But as long room for renegotiation remains, we may expect intra-household allocations to shift over time (Chiappori and Mazzocco 2017).[10,11] Women's bargaining power μ_t will be non-decreasing in their outside option and non-increasing in their husband's outside option, and vice versa for men.

Chiappori and Mazzocco (2017) show how the dynamic limited-commitment model can be formulated as a three-stage problem. In the first stage, households decide on the disposition of lifetime resources across time and states of nature. In the second stage, households decide on the optimal allocation of commodities for household production and time allocation in labor, leisure, and household production. This paper focuses on the final stage, the static "intra-household allocation" that corresponds to the stage at which households decide on the optimal allocation of private goods within the household members.

3.3 Household Budget Shares

Let ω_i^k be the hypothetical budget share of good k we would observe if individual i would independently maximize her own utility with respect to the shadow price vector $(\tilde{p})$ and her shadow income $(\eta^i y)$.

I parametrize the individual budget shares ω_i^k assuming price-independent generalized logarithm (PIGLOG) preferences,[12] a widely used parametrization in the literature.[13] The Almost Ideal Demand System (AIDS, Deaton and Muellbauer

[10]The outside option has also been modeled as the non-cooperative solution instead of divorce (Lundberg and Pollak 1993).

[11]The collective model is silent on how the relative Pareto weights are determined in each period. The evolution of μ_t over time can be thought of as the solution to a repeated bargaining model subject to the period's outside options (divorce, separation, or a non-cooperative arrangement). Or it may be thought of as updated only when one of the individual's participation constraints binds and renegotiation occurs to achieve a new feasible allocation more favorable to this individual (Mazzocco 2007).

[12]The indirect utility function of individual i can be expressed as $V_i(p,y) = \ln\left(\ln\left(\frac{y}{G_i(p)}\right)\right) + F_i(p)$. The Marshallian individual demands can be derived by applying Roy's identity: $\alpha_i^k(p) = p^k(\frac{\partial F_i(p)}{\partial p^k}\ln(G_i(p)) + \frac{1}{G_i(p)}\frac{\partial G_i(p)}{\partial p^k})$; $\beta_i^k(p) = -p^k\frac{\partial F_i(p)}{\partial p^k}$.

[13]See Attanasio and Lechene (2010), Attanasio and Lechene (2014), Dunbar, Lewbel, and Pendakur (2013), Calvi (2020), Sokullu and Valente (2018), Brown, Calvi, and Penglase (2019), Pen-

([1980](#))) is derived from the PIGLOG model. The main advantage is that it allows estimation of the budget shares as a system of Engel curves linear in $\ln(y)$[14]:

$$\omega_w^k = \alpha_w^k + \beta_w^k \ln(\eta) + \beta_w^k \ln(y) \tag{7}$$

$$\omega_h^k = \alpha_h^k + \beta_h^k \ln(1-\eta) + \beta_h^k \ln(y). \tag{8}$$

The household budget shares W^k for each good k can be expressed as[15]:

$$W^k(p, y) = \eta\omega_k^w + (1-\eta)\omega_h^k \tag{9}$$

$$W^k = \alpha^k + \beta^k \ln(y) \tag{10}$$

where the household preference parameters (α^k, β^k) for each good k depend both on household members' individual preferences and on the distribution of bargaining power within the household:

$$\alpha^k = \eta(\alpha_w^k + \beta_w^k \ln(\eta)) + (1-\eta)(\alpha_h^k + \beta_h^k \ln(1-\eta)) \tag{11}$$

$$\beta^k = \eta\beta_w^k + (1-\eta)\beta_h^k. \tag{12}$$

Private assignable goods. Household budget shares are simpler for private assignable goods. A good is private if it cannot be shared with other members of the household, that is no economies of scale. It is assignable if we can identify which member of the household consumes it, for example adult women. Let Γ_w

glase (2018), and Hoehn-Velasco and Penglase (2019).

[14] I also assume the resource shares are independent of total expenditure. The resource shares will still be allowed to depend on other variables highly correlated with y, such as education or income. Additionally, the expenditure independence assumption has failed to be rejected empirically in Italy (Menon, Pendakur, and Perali 2012) and the US (Cherchye et al. 2015).

[15]

$$W^k = \frac{\tilde{p}' z_k}{y} = \eta \frac{\tilde{p}' x_k^w}{\eta y} + (1-\eta)\frac{\tilde{p}' x_k^h}{(1-\eta)y}$$

$$\omega_w^k = \frac{\tilde{p}' x_k^w}{\eta y}; \omega_h^k = \frac{\tilde{p}' x_k^h}{(1-\eta)y}$$

and Γ_m be the vectors of the private assignable goods of adult women and men in the household, with $|\Gamma_w| + |\Gamma_m| \leq K$. The household consumption of a private assignable good is equal to the private equivalent consumption of this good. Let n_w and n_m be the number of adult women and men in the household, respectively. Assuming the resource share is divided equally among the adult women and adult men in the household (Calvi 2020), the household's budget shares of these private assignable goods can be expressed as:

$$W_w^k = \eta\omega_w^k = \eta[\alpha_w^k + \beta_w^k \ln(\eta) + \beta_w^k \ln(y/n_w)], \quad \forall k \in \Gamma_w \tag{13a}$$

$$W_m^k = (1-\eta)\omega_m^k = (1-\eta)[\alpha_m^k + \beta_m^k \ln(1-\eta) + \beta_m^k \ln(y/n_m)], \quad \forall k \in \Gamma_m. \tag{13b}$$

4 Effects of Crime on Household Expenditures

4.1 Homicide Data

I measure exposure to local crime with the homicide rate per 100,000 people at the municipality level. The data come from the National Institute of Statistics and Geography (INEGI). Homicides do not capture the whole crime environment civilians are exposed to, but they are much less subject to misreporting bias than other data. In addition, other data sources have confirmed the homicide numbers reported by INEGI. The trend also matches the available data on other crime activities, such as extortions and kidnappings (Heinle, Molzahn, and Shirk 2015).

I follow the relevant literature and I apply the quartic root transformation to the homicide rate. The quartic root serves as proxy for a logarithmic transformation avoiding either dropping zeroes or adding an arbitrary small amount. The transformation is similar to a log transformation for positive numbers. It is a common transformation for variables with outliers that could disproportionately influence the estimates, such as crime rates, saving rates, or earnings (Ashraf et al. 2015, Velasquez 2019). It has been used in most papers measuring the impacts of the Mexican drug war using the MxFLS data.

4.2 Household Data: Mexican Family Life Survey

The Mexican Family Life Survey (MxFLS) is a longitudinal survey containing a wide range of information at the community and household level, including a very detailed consumption module. The baseline (MxFLS-1) was conducted in 2002 and collected data on 8,442 households and over 35,600 individuals. The second wave was collected in 2005–2006 (MxFLS-2), right before the sharp increase in homicides in Mexico. The third wave was conducted in 2009–2012 (MxFLS-3), after the escalation of violence. The survey is representative at the national level, and for urban and rural areas within regions at baseline.

The timing of the MxFLS surveys allows the comparison of the same households before and after the escalation in violence across Mexico. Other researchers have used it to estimate causal effects of the Mexican drug war on labor markets (Velasquez 2019), youth male education (Brown and Velasquez 2017), birth outcomes (Brown 2018), risk aversion (Brown et al. 2018), and female decision-making power (Tsaneva, Rockmore, and Albohmood 2018). Velasquez (2019) documents that no statistically significant differences exist in the change in violence across MxFLS and non-MxFLS municipalities.

4.2.1 Sample structure

The main analytical sample includes every household consisting of at least one head and his/her spouse who were interviewed both in the 2005–2006 and 2009–2012 MxFLS waves. Hence, the sample includes married couples that were already formed by the time MxFLS-2 was collected in 2005–2006.

I further restrict the sample by dropping households with missing age or relationship to the head for any household member, households with missing education information for the household head or the spouse, same-sex couples, households where the head or the spouse is less than 14 years old, households with missing consumption or assets module, households in the top and bottom 1% of total annualized expenditures, households who reported zero expenditure in food, and households with missing timing or location of the interview. I apply these restrictions to both survey waves. After these restrictions, the sample contains 5,637 eligible households from the 2005-2006 MxFLS-2. Of these, 5,191 are re-interviewed in 2009–2012 (92%). But after applying the same sample restrictions to MxFLS-3, the final sample consists of 4,251 households (8,502 household-survey wave observations). Given the interest in intra-household decision-making, I also present the analysis restricting the sample to nuclear households with children; these households contain only the wife, husband, and children (e.g., no grandparents or siblings).

4.2.2 Descriptive statistics

Table 1 presents descriptive statistics of the analytical sample measured at the 2005–2006 wave. The first column shows the mean and standard deviation of several household characteristics. Overall, 42% of the households live in rural localities, only 40% of the wives and husbands have achieved secondary education or higher, and the average household size is 4.49 members. Appendix Table A1 reports similar descriptive statistics when restricting the sample to nuclear households with children. The nuclear subsample is more educated, and younger (on average, women and men are 38 and 41 years old, respectively, vs. 42 and 45 in the whole sample).

Table 1 also presents statistical differences in household characteristics by different measures of violence in households' municipalities of residence. Each of the rows in columns (2) to (4) of Tables 1 and A1 report the OLS coefficient and standard error, in parentheses, of a regression of the household characteristic on the measure of the municipality's violence, clustering standard errors at the municipality level. In general, households self-select into their place of residence, and the homicide rate in their municipality of residence cannot be treated as randomly assigned. Column (2) documents that households who lived in municipalities with a greater homicide rate in 2005–2006 were more likely to live in urban localities and to be more educated. This observation is consistent with the higher prevalence of homicides in Mexican urban areas.

The sharp and heterogeneous increase in violence, however, was largely unanticipated, as previously discussed. Columns (3) and (4) of Tables 1 and A1 show

Table 1: Descriptive Statistics: Household Characteristics in 2005–2006

	Mean and standard deviation (1)	**Violence variables** $\sqrt[4]{H_{m2005}}$ (2)	ΔH_m (3)	$\Delta\sqrt[4]{H_m}$ (4)
Wife's age	42.26	-1.19***	-0.01	0.45
	[13.22]	(0.42)	(0.02)	(0.34)
Husband's age	45.67	-1.33***	-0.00	0.74*
	[14.02]	(0.46)	(0.02)	(0.45)
Age gap	3.42	-0.14	0.01	0.28
	[5.26]	(0.13)	(0.01)	(0.19)
Wife's secondary	0.40	0.07***	0.00	-0.01
	[0.49]	(0.02)	(0.00)	(0.02)
Husband's secondary	0.42	0.06***	-0.00	-0.02
	[0.49]	(0.02)	(0.00)	(0.02)
Number of children	2.24	0.01	-0.00	-0.06
	[1.56]	(0.06)	(0.00)	(0.05)
Average age children	14.23	-0.38	-0.01	0.08
	[9.18]	(0.30)	(0.01)	(0.24)
Share of daughters	0.50	0.01	-0.00	-0.00
	[0.36]	(0.01)	(0.00)	(0.01)
Rural locality	0.42	-0.15***	0.00	0.10*
	[0.49]	(0.05)	(0.00)	(0.05)
Household size	4.69	0.01	-0.00	-0.07
	[1.93]	(0.07)	(0.00)	(0.06)
Nuclear household	0.79	0.01	-0.00	-0.01
	[0.41]	(0.01)	(0.00)	(0.01)
Domestic partnership	0.15	0.01	0.00	0.01
	[0.35]	(0.01)	(0.00)	(0.01)
Observations	4,251	4,251	4,251	4,251
Joint equality test (p-value)		0.17	0.57	0.57

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column (1) presents sample means and standard deviations, in brackets, of the analytical sample in MxFLS-2. Columns (2) - (4) are calculated with OLS and clustering standard errors (in parentheses) at the municipality level. Column (2) reports the OLS coefficient of a regression of the household characteristic on the homicide rate in 2005–2006 MxFLS-2. Column (3) reports an OLS coefficient of a regresion of the household characteristic on the increase in the homicide rate between MxFLS-2 and MxFLS-3. Column (4) also reports an OLS coefficient, but of the increase in the quartic root of the homicide rate.

Table 2: Descriptive Statistics: Household Expenditures in 2005–2006

	Mean and standard deviation	Violence variables		
		$\sqrt[4]{H_{m2005}}$	ΔH_m	$\Delta\sqrt[4]{H_m}$
	(1)	(2)	(3)	(4)
Total expenditure	59,565.98	4,166.74*	77.56	476.88
	[45,738.69]	(2,196.99)	(70.37)	(2,143.59)
Ln(total expenditure)	10.74	0.08*	0.00*	0.03
	[0.72]	(0.04)	(0.00)	(0.04)
Food	56.27	-1.56*	0.04	1.38
	[18.36]	(0.92)	(0.03)	(0.85)
Drinks and Tob.	3.50	-0.11	0.01**	0.27
	[4.26]	(0.19)	(0.01)	(0.18)
Male adult clothing	1.50	0.06	-0.00*	-0.08
	[2.72]	(0.07)	(0.00)	(0.06)
Female adult clothing	1.54	-0.06	-0.00	0.00
	[2.75]	(0.08)	(0.00)	(0.07)
Children goods	1.90	-0.05	0.00	0.05
	[3.43]	(0.10)	(0.00)	(0.10)
Hygiene, personal care	5.90	-0.12	0.00	0.07
	[4.82]	(0.17)	(0.01)	(0.11)
Other household goods	13.23	0.47	-0.01	-0.35
	[10.04]	(0.37)	(0.01)	(0.30)
Transportation	7.77	0.40	-0.00	-0.32
	[9.98]	(0.33)	(0.01)	(0.41)
Health	1.65	0.01	-0.00	-0.08
	[5.08]	(0.15)	(0.00)	(0.14)
Education	4.17	0.65***	-0.02***	-0.71***
	[8.79]	(0.23)	(0.01)	(0.22)
Recreation	2.52	0.28*	-0.01	-0.21
	[6.16]	(0.16)	(0.01)	(0.17)
Gambling	0.05	0.02**	-0.00**	-0.02**
	[0.45]	(0.01)	(0.00)	(0.01)
Shares joint eq. test (p)		0.07	0.02	0.01
Observations	4,251	4,251	4,251	4,251

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column (1) presents sample means and standard deviations, in brackets, of the analytical sample in MxFLS-2. Columns (2) - (4) are calculated with OLS and clustering standard errors (in parentheses) at the municipality level. Column (2) reports the OLS coefficient of a regression of the expenditure share on the homicide rate in 2005–2006 MxFLS-2. Column (3) reports an OLS coefficient of a regresion of the expenditure share on the increase in the homicide rate between MxFLS-2 and MxFLS-3. Column (4) also reports an OLS coefficient, but of the increase in the quartic root of the homicide rate.

that the increase in the level and quartic root of the annual homicide rate has no predictive power on household characteristics in 2005–2006. I also report joint tests checking the significance of all the household characteristics simultaneously. I run a linear regression of the increase in the level and quartic root of the homicide rate on all household characteristics and test the joint significance of the coefficients. I fail to reject the null hypotheses across specifications, providing further evidence that households were not systematically different at baseline in terms of ex-post violence changes, at least with respect to observable characteristics.

4.2.3 Total expenditure and expenditure shares

The total expenditure data and the corresponding budget shares are estimated using self-reported monetary-value information about household purchases and the home production of non-durable goods. I first transform all the expenditures on individual items into a comparable annual period. Then, total expenditure on non-durables is calculated by aggregating the annualized recalled household expenditure on food, drinks and tobacco,[16] hygiene and other personal goods, adult male clothing, adult female clothing, other household public goods (e.g., detergent, utilities), health care and health services, transportation, communication, recreation, education (including tuition fees), and gambling.[17] The methodology used to estimate total expenditure is similar to the one used by Attanasio and Lechene (2010), Attanasio and Lechene (2014), and Bobonis (2009) in their estimation of Engel curves for Mexican households.

Tables 2 report descriptive statistics of households' expenditure patterns in 2005–2006. The average annual total expenditure is approximately 60,000 MXN ($8,000 2005 in US PPP[18]). The largest expenditure share is food, accounting for almost 60% of total household expenditures in the sample. Appendix Table A3 shows the equivalent numbers when restricting the sample to nuclear households with children.

[16]This category includes alcoholic beverages as well as juices, purified water, and powder for preparing water.

[17]Table A2 provides a detailed description of each of the goods included in the analysis, including the recall period of each category.

[18]Source: Purchasing Power Parity 2005, World Health Organization.

In 2005–2006, households living in more violent places had a higher total expenditure, a lower expenditure share on food, and a higher expenditure share on education and recreation (column 2), consistent with living in more urban areas. In columns (3) and (4), I show the 2005-2006 expenditure shares on education, recreation, and drinks & tobacco, have some predictive power on the posterior change in homicide rates. Although these regressions do not control for any household characteristic and I fail to reject the null hypothesis of joint significance across budget shares, which highlights the importance of using a longitudinal survey that provides the ability to control for initial household characteristics in different types of municipalities.

4.3 Empirical Strategy

The longitudinal nature of the MxFLS data allows the comparison of the same households before and after the onset of the Mexican drug war, while isolating the effects that the rise in violence may have had on selection into marriage. But two other sources of sample selection may raise concerns: selective migration and selective attrition.

4.3.1 Selective attrition

The MxFLS survey was quite successful in terms of attrition: 89% of the original respondents from the 2002 baseline were interviewed again in both MxFLS-2 and MxFLS-3. The high retention rate, however, does not alleviate the concerns of selective attrition if the probability of individuals being reinterviewed in the third wave is correlated with the exposure to the violence. In Appendix A.3, I provide evidence that the increase in homicide rates at the municipality level does not predict the probability of attrition. I also document that the null effect does not seem to mask heterogeneity based on household characteristics. The results are consistent with the lack of evidence of selective attrition in the MxFLS at the individual level documented by previous studies (Brown and Velasquez 2017, Velasquez 2019).

4.3.2 Selective migration

Previous research has found effects of the Mexican drug war on migration behavior (Orozco-Aleman and Gonzalez-Lozano 2018, Basu and Pearlman 2017). The results of this paper could be biased if migrants and non-migrants have different characteristics, and they are correlated with their consumption patterns. In Appendix A.4, I provide evidence that although the average effect of violence intensity on the probability of migration is not statistically significantly different from zero, some heterogeneity exists. Households with a highly educated husband and nuclear rural households were more likely to migrate between survey waves in the face of greater violence.

I implement an "intent-to-treat" approach to deal with the suggestive evidence of selective migration. I follow the relevant literature assigning the 2005–2006 households' municipality of residence to both survey waves. This methodology might induce attenuation bias, but it lessens concerns about the results been driven by migration behavior (Brown and Velasquez 2017, Velasquez 2019, Brown et al. 2018).

4.3.3 Household fixed-effects methodology

The sharp and heterogeneous increase in homicides in Mexico was largely unanticipated, as previously discussed. Estimating causal effects of violent crime on households' outcomes requires, however, addressing concerns over potential sources of omitted variable bias. The identification strategy relies on comparing the same households over time by controlling for household fixed effects. I therefore can control for any time-invariant household characteristics potentially correlated with both the trends of violence and of the households' budget shares. Given the intention-to-treat approach—the municipality of residence is kept constant across the two survey waves—the household fixed effects also effectively control for any time-invariant characteristics at the municipality level.

The main threat to identification would be that the geographic and temporal variation in homicides reported in Mexico was actually anticipated or was correlated with other underlying trends related to households' consumption patterns. To address these concerns, the main specification also controls for many time-varying characteristics, and I demonstrate the results are consistent throughout multiple robustness checks. These checks include, but are not restricted to, flexibly allowing for non-linear specifications of time-varying controls implementing double-lasso, a placebo exercise to test for unobserved municipality trends, and randomization-based inference.

4.4 Effect of Violence on Total Household Expenditure

Prior to the estimation of demand equations, I study whether increases in local crime led to changes in total household expenditure with the following specification:

$$\ln(y_{ijt}) = \alpha + \gamma H_{jt} + \Theta D_{ijt} + \lambda_t + \delta_i + \epsilon_{ijt} \tag{14}$$

where $\ln(y_{ijt})$ is the logarithm of total household expenditure on non-durable goods by household i living in municipality j and year t. H_{jt} is the measure of violence in municipality j and year t. It is defined as the quartic root of the homicide rate per 100,000 people over the last 12 months prior to the interview.[19] D_{ijt} is a vector of time-variant household characteristics; δ_i are household fixed effects that will control for both time-invariant household and municipality characteristics; λ_t are year-of -interview fixed effects; and ϵ_{ijt} are conditionally mean-zero errors clustered by municipality. The vector of household characteristics D_{ijt} includes the following: the wife's and husband's age, age squared, and secondary-education indicator variables; number of household members by age group and gender; the log of the household size; and month-of-interview fixed effects.

Increases in violent crime did not have a significant effect on total household expenditure (Table 3). The null effects are present both for the whole analytical sample and for the nuclear subsample. The point estimates flip sign—from positive to negative—with the inclusion of household fixed effects, but the effect of violence remains statistically insignificant at any conventional level (p-values >0.40). I also do not find substantial evidence of heterogeneous effects of homicides on total expenditure by household characteristics (Appendix Figure A1).

[19]As discussed in section 4.1, the quartic root resembles the logarithmic transformation without having to drop or transform observations with a homicide rate equal to 0, and is commonly used in the the crime literature and other fields in the presence of outliers (Velasquez 2019, Ashraf et al. 2015).

Table 3: Effect of Homicide Rates on Total Household Expenditure

	All households (1)	(2)	**Nuclear households** (3)	(4)
$\sqrt[4]{}$ Homicide rate last 12 months	0.027	-0.018	0.011	-0.009
	(0.024)	(0.022)	(0.023)	(0.026)
Household controls	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓
Household FE		✓		✓
Y mean	10.87	10.87	10.92	10.92
Observations	8,502	8,502	5,626	5,626
adj. R^2	0.26	0.55	0.27	0.55

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level. The outcome variable is the logarithm of total household expenditure on non-durable goods. Household controls include wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

4.5 Effect of Violence on Expenditure Shares

In section 4.4, we saw that the increase in local violence did not affect total household expenditure within the MxFLS sample. But this does not mean it had no effect on household decision-making with respect to expenditure allocations. To study the effect on expenditure composition, I estimate a system of households' Engel curves. I use an approximation to AIDS (Deaton and Muellbauer 1980), parametrizing and adding an error term to each equation of (9):

$$W^k_{ijt} = \alpha^k + \beta^k \ln(y_{ijt}) + \gamma^k H_{jt} + \Theta^k D_{ijt} + \lambda^k_t + \delta^k_i + \epsilon^k_{ijt} \qquad (15)$$

where W^k_{ijt} is the budget share spent on good k by household i living in municipality j in year t. The coefficient of interest is γ^k, and H_{jt} is the measure of violence in municipality j and year t. It remains defined as the quartic root of the homicide rate per 100,000 people over the last 12 months prior to the interview. As in Table 3, $\ln(y_{ijt})$ is the logarithm of total household expenditure on non-durable goods; D_{ijt} is a vector of time-variant household characteristics; δ^k_i are household fixed effects that will control for both time-invariant household and municipality characteristics;

λ_t^k are year-of-interview fixed effects; and ϵ_{ijt}^k are conditionally mean-zero errors.[20]

4.5.1 Estimation Strategy

I estimate the set of Engel curves specified in (15) simultaneously as a system allowing for correlation of the error terms, clustering at the municipality level.

Prices The assumption of two-stage budgeting and the AIDS parametrization imply the consumption of each of the goods is determined by its own price, prices of other goods, total expenditure, and some idiosyncratic household characteristics.

We may worry that the estimates could, at least partially, pick up the effects that changes in violence can have on local prices. For example, the increase in homicides may distort supply chains of some goods if to delivering them to markets becomes more dangerous, although to my knowledge, no empirical evidence to date documents such effects.

I proxy for local prices estimating the demand equations including state-time fixed effects (see Attanasio and Lechene (2014) or Armand et al. (2020) for similar methodologies). This approach requires that prices are constant within a state, though they can vary across time, and I also include a rural locality linear trend to account for urban versus rural differences over time.

I also provide evidence that the increase in homicides did not have a meaningful impact on local prices, at least within the MxFLS municipalities. Ideally, I would calculate unit values, dividing information on expenditure by quantity purchased. This approach is not feasible across all the non-durable goods considered, given the infrequency of purchases of many items. For six out of 12 expenditure categories, the fraction of zeros is greater than 50%. Alternatively, I use market prices collected at the community level by the MxFLS. Two main limitations exist: not all goods have price information, and the choice to aggregate at the municipality level needs to be somewhat arbitrary. I aggregate prices by estimating the median price across markets and communities within the municipality. Appendix Table A18 presents the

[20] The vector of household characteristics D_{ijt} includes the following: the wife's and husband's age, age squared, and secondary education indicator variables; number of household members by age group and gender; the log of the household size; and month-of-interview fixed effects.

results of difference-in-differences estimations of the price indices by good category. The point estimates are insignificant across the board both from a statistical and an economical evaluation. The point estimates are negative for all the goods considered: food, household goods, men's clothing, women's clothing, and children's clothing. The largest negative point estimates are for household goods and women's clothing.

Double-lasso I augment the Engel curves specified in (15) implementing the post-double-cluster-lasso methodology proposed by Belloni et al. (2016), which allows me to control for household fixed effects and a clustered covariance structure. The following steps summarize the methodology: (i) Select control variables that predict H_{jt} by cluster-lasso; (ii) select control variables that predict the budget shares W^k_{ijt} by cluster-lasso, excluding the regressor of interest H_{jt}; and (iii) estimate the coefficient of interest γ^k controlling for any variables selected in either of the first two steps, clustering errors at the municipality level. I include total household expenditure in each of the three steps, as well as household and time fixed effects.

The main goal of the double-selection methodology is to deal with potential omitted variable bias. The first step helps implement robustly the conditional exogeneity assumption finding variables that are highly correlated with the homicide rate and could be confounding factors. The second step aims to keep the residual variance small by providing a good prediction of the budget shares, and it is an additional opportunity to find confounders (Belloni, Chernozhukov, and Hansen 2013).[21]

The double-lasso methodology also permits relaxation of the assumption of a linear functional form of the household controls. It is a semi-parametric estimation of a data-driven partially linear model. I include the original set of household controls, their square, and interactions among all controls.[22]

[21]The cluster-lasso coefficients from step 1 and step 2 are the solution to a penalized minimization problem with the standard lasso λ penalty parameter, and covariate specific penalty loadings to allow for data with potential dependence within municipalities. The last step is a simple linear regression of the lasso selected variables (post-lasso), because the lasso coefficients will be generally substantially biased toward zero.

[22]I remove one control from any pair of covariates that had a bivariate correlation exceeding 0.99 in absolute value. High-dimensional variable-selection methods work best when the set of variables to be selected is not very large (Belloni, Chernozhukov, and Hansen 2014). Note the

Endogeneity of total household expenditure. The coefficients of interest are γ^k, the effects of violent crime on budget shares. Also, the increase in homicides had no effect on total expenditures (section 4.4), which alleviates concerns of misspecification bias. However, if we are interested in an unbiased estimation β^k, we need to address potential endogeneity due to non-random recall or measurement error.[23]

To deal with these issues, I use household wealth as an instrumental variable for total household expenditure within a period. This strategy is standard when estimating demand equations (Dunbar, Lewbel, and Pendakur 2013; Armand et al. 2020). The theoretical foundation relies on households' inter-temporal problem of allocating resources over time and across states of nature. Wealth will be uncorrelated with unobserved consumption heterogeneity within the same period if consumption decisions within a period are separable from saving decisions across time.[24]

In the estimation, I implement the instrumental variable strategy, using a control function approach bootstrapping the standard errors (clustering by municipality). The first-stage regressions are reported in Tables A25 and A26 for the whole sample and the nuclear households subsample, respectively. The instrument has the expected positive effect on total expenditure and is highly predictive (F statistic of 50 in whole sample and 27 in the nuclear subsample). The first stage is also strong when we include the square of the wealth instrument, which I use when testing the validity of the linear specification in section 4.5.3.

The instrumentation of contemporaneous expenditure with contemporaneous wealth in the presence of household fixed effects also requires the lack of unobserved trends

variables post selected by lasso can vary across the different demand regressions.

[23]Households are assumed to engage in two-step budgeting. They first decide how much to allocate in each period t and then how the total expenditure is allocated within the current period (Chiappori and Mazzocco 2017). This assumption raises endogeneity concerns if we worry about households' time preferences being potentially correlated with unobserved preference heterogeneity. Additionally, recall bias and other types of non-random measurement error are a common concern when dealing with self-reported expenditure data.

[24]The wealth instrument is constructed by taking the natural logarithm of the monetary value of the assets owned by the household: land, bicycles, automobiles and other vehicles, household appliances, financial assets, and livestock and other agricultural assets. Appendix A.5 provides more detailed discussion.

correlated with both the growth in households' wealth and households' budget shares. Note the household fixed-effects model within a two-period framework is equivalent to a model in first differences. Hence, as a robustness check, I also estimate the Engel curves with two other instruments: wealth at the time of MxFLS-1 (2002) and wealth at the time of MxFLS-2 (2005–2006).[25]

4.5.2 Results

Tables 4 and 5 present the results of the household Engel curves specified in (15). Table 4 presents the estimates on the log of total expenditure (β^k). Table 5 reports the coefficients of interest γ^k, the effect of an increase in homicide rates on expenditure shares. All regressions include household time-varying controls, as well as household, year, and month fixed effects. Column (1) does not instrument total expenditure, whereas columns (2) to (4) instrument expenditure with the wealth instrument. Column (3) selects controls implementing the double lasso methodology. Column (4) includes state- and rural-time linear trends to control for unobserved prices. Appendix Table A4 restricts the sample to nuclear households with children.

Expenditure elasticities The coefficients on total expenditure show that food is a necessity, consistent with Engel's law. An increase of 10% in total expenditure is associated with a decrease of 1.6 percentage points in the food budget share. Hygiene and care goods are also necessities, that is they have expenditure elasticity less than one. The expenditure elasticities of food and hygiene goods (at the mean sample values) are equal approximately equal to 0.7 (Table A5).[26]

The estimates suggest the following goods and services are luxury goods, that is expenditure share increases as total spending rises: clothing, male care goods, children's goods, transportation, health, education, and recreation.

[25] The results are very similar and are available upon request.

[26] The elasticities are equal to $1 + \frac{\beta^k}{W^k}$, with W^k equal to the average budget share for good k across the two survey waves. Expenditure elasticities are calculated in the standard form for Working-Leser Engel curves (Vreyer, Lambert, and Ravallion 2020; Armand et al. 2020):

$$\frac{\partial \ln(W^k y)}{\partial \ln(y)} = \frac{\partial \ln(W^k y)}{\partial y} y = 1 + \frac{\beta^k}{W^k} \tag{16}$$

Table 4: Engel Curves: Coefficients on Log Expenditure

	(1)	(2)	(3)	(4)
Food	-12.68***	-16.68***	-16.36***	-16.41***
	(0.59)	(3.75)	(3.66)	(3.88)
Drinks and Tobacco	-0.25*	-0.14	-0.03	-0.01
	(0.14)	(0.90)	(0.91)	(0.97)
Male adult clothing	0.68***	1.92***	2.02***	2.02***
	(0.10)	(0.63)	(0.63)	(0.65)
Female adult clothing	0.71***	1.33*	1.28	1.18
	(0.10)	(0.80)	(0.79)	(0.82)
Children goods	0.49***	1.19	1.11	1.10
	(0.15)	(0.75)	(0.71)	(0.77)
Hygiene and care	-0.63***	-1.57	-1.44	-1.58
	(0.18)	(1.27)	(1.21)	(1.26)
Other hh goods	1.69***	1.24	1.21	1.06
	(0.48)	(2.45)	(2.43)	(2.57)
Transportation	6.42***	8.18***	7.92***	8.39***
	(0.41)	(2.29)	(2.21)	(2.34)
Health	1.73***	0.80	0.64	0.57
	(0.23)	(0.94)	(0.89)	(0.93)
Education	-0.55***	0.48	0.33	0.31
	(0.10)	(0.70)	(0.67)	(0.71)
Recreation	2.31***	3.12**	2.87**	2.85**
	(0.18)	(1.25)	(1.21)	(1.25)
Gambling	0.08**	0.12	0.14	0.16
	(0.03)	(0.10)	(0.09)	(0.10)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table 4 reports coefficient β^k on $\ln(y)$ of each demand equation (15). Estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure multiplied by 100. Household controls include wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary-school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table 5: Effect of Homicide Rates on Expenditure Shares

	(1)	(2)	(3)	(4)
Food	-1.07**	-1.15**	-1.18**	-0.93*
	(0.45)	(0.49)	(0.48)	(0.54)
Drinks and Tobacco	0.05	0.06	0.05	-0.21
	(0.14)	(0.14)	(0.14)	(0.19)
Male adult clothing	0.21***	0.23***	0.20***	0.23***
	(0.06)	(0.08)	(0.07)	(0.08)
Female adult clothing	0.06	0.07	0.06	0.06
	(0.07)	(0.07)	(0.07)	(0.09)
Children goods	-0.07	-0.06	-0.08	0.03
	(0.13)	(0.14)	(0.14)	(0.16)
Hygiene and care	-0.43***	-0.45**	-0.41**	-0.36*
	(0.15)	(0.17)	(0.17)	(0.19)
Other hh goods	0.20	0.20	0.26	-0.03
	(0.27)	(0.31)	(0.29)	(0.36)
Transportation	0.58**	0.61**	0.62**	0.93***
	(0.29)	(0.29)	(0.30)	(0.32)
Health	0.26*	0.24	0.27*	0.25
	(0.15)	(0.16)	(0.15)	(0.21)
Education	0.06	0.08	0.08	0.11
	(0.08)	(0.09)	(0.09)	(0.10)
Recreation	0.13	0.15	0.13	-0.09
	(0.17)	(0.19)	(0.18)	(0.19)
Gambling	0.02*	0.02*	0.02*	0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Household controls	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Instrument expenditure		✓	✓	✓
Double Lasso			✓	✓
Price proxy				✓
Observations	8,502	8,502	8,502	8,502

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table 5 reports coefficient γ^k on the quartic of the homicide rate in 100,000 of each equation (15). Estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure multiplied by 100. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary-school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Effect of violent crime on food and other necessities The results present evidence that an increase in the local homicide rate shifted downward the intercept on the Engel curve of food and hygiene and personal care goods. Both of these goods are necessities. A household living in a non-violent municipality in 2005–2006, who then experienced the average increase in homicides (15 in 100,000), decreased the share of total expenditure allocated to food by 2.26 percentage points less of food, and to hygiene and other household necessities by 0.84 percentage points.[27] The effect is not statistically different across food categories, and the food shares within the food basket—controlling for total food expenditure instead of total household expenditure—are not significantly affected by the homicide rate (Tables A7, A6).

Effect of violent crime on male and female goods The results indicate an increase in the local homicide rate led to an increase in the budget share spent on adult male clothing. The effect is very robust across specifications. A household living in a municipality that experienced the average increase in the annual homicide rate consumed around 0.47 percentage points more of adult male clothing. The result is almost identical across nuclear and non-nuclear households. This effect is quantitatively significant, given the average expenditure share on male clothing in 2005–2006 was 1.5%. In contrast, the effect of homicides on adult female clothing is small and not statistically significant across specifications.

The results also provide some evidence that the increase in homicide rates led to greater expenditure share on gambling, which has been reported to be more common among Mexican men than women (Velazquez et al. 2018).

Finally, the hygiene and personal care goods budget share can be split in household goods, women care goods, and men care goods. Tables A8 and A9 replicate the results splitting the budget share in the three categories. The effect on household personal care goods remain negative and statistically significant (0.47 percentage points average decrease). Female and male care goods experienced a negative effect, although the latter is smaller and less robust statistically. I show in the Appendix

[27] The estimates for good k are calculated as $\hat{\gamma}^k * \sqrt[4]{15}$.

that the combined effect of crime on total male goods (clothing plus care goods) is still large, positive, and significant, for an average increase of 0.27 percentage points.

Effect of violent crime on other goods and services The results also provide some evidence that the increase in homicide rates lead to greater expenditure share on transportation and on health expenses. The results on transportation are driven by school transportation. These results may reflect households adapting routes and modes of transportation in response to the increases in the risk of victimization.

4.5.3 Threats to identification and robustness checks

Placebo test: Unobserved municipality trends The main threat to identification would be that the heterogeneous geographic and sharp temporal variation in homicides reported in Mexico was actually anticipated or was correlated with other underlying trends related to households' consumption patterns. I conduct a placebo test estimating the same system of demand equations using data from the 2002 MxFLS-1 and the 2005–2006 MxFLS-2, but assigning to each survey wave the homicide rate of the subsequent wave. In the within-household framework, this test captures whether prior trends of households' budget shares are correlated with posterior changes in homicides at the municipality level. The future homicide rate changes should not predict changes in consumption patterns between 2002 and 2005. The effect of violence on the budget shares is never simultaneously statistically significant and of the same sign as in the main results (Table A10).

These results alleviate concerns with respect to non-random linear unobserved municipal trends. A word of caution remains with respect to sources of bias coming from non-linear omitted trends. However, they would need to be on a similar temporal path as the increase in homicides rates, and to mirror the geographic heterogeneity of the change in violence in Mexico after 2006.

Other confounders One might also worry that local economic conditions are a potential confounder, especially given the occurrence of the Great Recession between the two survey waves. Previous research has failed to provide evidence in support of a significant relationship between the heterogeneity in the exposure to violence and to the economic effects of the Great Recession (Velasquez 2019). I augment the demand equations (15) with local economic controls to alleviate concerns about municipality-level confounders. First, I add a large number of economic municipality controls.[28] Second, I implement post-double-lasso allowing for a flexible functional form of the controls including higher polynomial orders and interactions among the household and municipality controls. Table A11 shows the estimated effects on food and male clothing budget shares are robust to the inclusion of municipality economic controls. Third, I show the results are robust to excluding one state at the time, given states were likely differentially affected by the economic recession.

Quadratic expenditure specification The Engel equations in (15) assume a linear relationship between total expenditure and expenditure shares. The null effect of the increase in homicides on total expenditure (Table 3) alleviates concerns about misspecification bias of the estimate of crime on the budget shares.

I investigate whether the results are robust to the Quadratic Almost Ideal Demand System (QUAIDS), a common parameterization that consists of a generalization of the AIDS model introducing a quadratic term for total expenditure. QUAIDS introduces a more flexible relationship and allows for the possibility of a good being a luxury at very low levels of expenditure and a necessity afterwards. For example, for households living at the subsistence level, the food expenditure share may increase with total income at first. Figure A2 plots non-parametric regressions of the budget shares on the logarithm of total expenditure in both survey waves. Engel curves are negatively sloped for food: as theoretically predicted by Engel's law, food is a necessity. The rest of the goods are positively sloped, except for drinks and tobacco and hygiene and personal care goods where non-linearities are visually detected.

[28]The municipality-level controls are the following: share of manufacturing, commerce, and services employment, the logarithm of total electricity consumption, share of rural population, Gini index, food poverty index, assets poverty index, and capacities poverty index. Sources: Population Census, Federal Electricity Commission, ENIGH, Technical Committee on Poverty Measurement. The three poverty measures are monetary poverty measures. Capacities poverty is defined as the lack of sufficient household resources to maintain expenditures on a minimum diet, education, and health care. Assets poverty expands the notion of capabilities poverty to include households that cannot afford clothing, housing, energy, and transportation expenditures. I thank Enamorado et al. (2016) for making the inequality and poverty data and descriptions publicly available.

These graphs also show that, except for gambling, for which the data exhibit little variation, Engel curves are not flat.

Table A12 plots the coefficients on log expenditure, log expenditure squared, and the quartic root of the homicide rate. To control for unobserved prices in the QUAIDS specification, we must include interactions of the indicators of region (state and rural dummy) and time with the intercept, the log total expenditure, and log total expenditure squared. [29] The results on the effect of violence on households' expenditure shares are robust to the quadratic specification controlling for unobserved prices as well (Table A13).

Randomization-based Inference I analyze the likelihood that the main results could have occurred by chance, by generating randomness in the exposure to increased local violence and calculating randomization-based p-values (Young 2019, Athey and Imbens 2016). I randomly reassign increases in homicides, drawing values from the original distribution in the sample of interest. I then reestimate the main set of results and calculate what the coefficient of interest would have been under this new distribution of homicide rates. The observed outcome variables do not change for any unit under the null hypothesis, but the estimate of the coefficient on homicides does. I repeat the procedure 2,000 times.[30] The randomization-based p-value is the proportion of reassigned estimates at least as large in absolute value as the actual estimate. I plot the distribution of coefficient estimates in Appendix Figure A4. The vertical dashed line in each graph plots the estimated coefficient in the main specification. The p-values associated with these statistics are approximately 0.003 (food budget share), 0.000 (hygiene/personal care budget share), 0.000 (male clothing), 0.035 (transportation), and 0.107 (health). These p-values indicate that the sharp null hypothesis that the increase in homicides had no effect on households' expenditure shares among these good categories should be rejected.

[29] In both specifications, I instrument the log of total expenditure and its square with the wealth instrument and its square. Both tables report the F-statistic of the first-stage regressions; they are all above 20. I use a control function approach including the first-stage residuals, and the square of the residuals in the regressions of interest, and standard errors are bootstrapped.

[30] Young (2019) finds no appreciable changes in rejection rates after 2,000 repetitions.

Multiple hypothesis testing The set of demand equations involves as many hypothesis tests as separate good categories. Therefore, the probability of type-I error—the probability of one or more false rejections—is greater than the size of the test I choose when deciding whether to reject the null hypothesis of statistical significance in each regression. I reestimate the main results controlling for the familywise error rate (FWER), which is the probability of making any type-I error across the 12 equations. Specifically, I implement the procedure for multiple hypothesis testing based on List, Shaikh, and Xu (2019) within a multivariate regression setting.[31] The procedure allows for p-values to be correlated across specifications and to cluster at the municipality level using a bootstrapping approach. Appendix Table A14 reports the FWER p-values and shows the results are robust.

Mundlak effects The main specification controls for unobserved heterogeneity including household fixed effects. The fixed-effects framework does not assume the unobserved effects are random; instead, they are allowed to be correlated arbitrarily with the remaining regressors (Wooldridge 2001). An alternative approach is a correlated random-effects framework that specifically models the dependence between the unobserved heterogeneity and the regressors.

Mundlak (1978) models the unobserved effects as a linear function of the mean household characteristics across survey waves $\delta_i^k = \bar{x}_i\theta^k + \nu_i^k$. This methodology is used to replace household fixed effects when the model uses time-invariant regressors of interest.[32] This approach is also crucial for analyzing non-linear models with unobserved heterogeneity as in the estimation of resource shares in section 5.2. In addition, rejecting the null hypothesis, $\theta^k = 0$, provides evidence in favor of the fixed-effects approach, as opposed to a standard random-effects framework. Table A15 shows the results are qualitatively identical and very similar quantitatively. The results also present the p-values of the null hypotheses $\theta^k = 0$. Although there is heterogeneity, I do not fail to reject the null hypothesis across the board.

[31] I use the *mhtreg* Stata package developed by Andreas Steinmayr, LMU Munich.

[32] For example, Vreyer, Lambert, and Ravallion (2020) include Mundlak effects in the estimation of household Engel curves in Senegal.

This highlights the importance of controlling for household unobserved heterogeneity through either the inclusion of household fixed effects or Mundlak effects.

4.5.4 Ruling out mechanisms

In this section, I show there is no robust evidence of the results being driven by the following mechanisms: home production, household composition, households' standards of living, and male labor supply.

Home production and gifts The effects of violence on the budget shares are not driven by changes in gifts or by shifts in the type of goods households produce. The budget shares are calculated including consumption that the household purchased, received as a gift or payment, or obtained from its crops, animals, or businesses. The concern would be that the increase in homicides could have affected informal trading markets, gifts and transfers, or the type of home production households engage in. Appendix Table A16 splits the budget shares into purchased and gifts/self-production and shows household purchases drive the effects on expenditures.

Household composition The main results include controls for the number of people living in the household by gender and age group (0-6, 7-11, 12-18, 19-55,+55). If the change in local violence has an impact on household composition, the results capture the average effect of the increase in homicides on consumption net of the effect on the number and type of household members. Appendix Table A20 shows the measure of local violence does not predict changes in the number and type of household members, except for a very small negative effect on the number of young boys ages 7 to 11. In addition, treating changes in household composition as a mechanism through which violence can affect consumption relies on the assumption that the outcome variables do not affect who lives in the household. However, the results could suffer from collider bias if changes in the intra-household allocation of resources leads certain household members to join or to leave the family unit. The results are also robust to the exclusion of the household composition variables.

Households' standards of living The negative relationship between total household income and expenditure in food is one of the most universal stylized facts, well-known as Engel's law. This negative relationship has also been documented among Mexican households (Attanasio and Lechene 2010). The non-parametric Engel curves are consistent with this negative relationship (Figure A2). The positive effect of homicides on the shares spent on luxury goods could also raise concerns about the possibility of homicides reflecting an increase in households' income.

Ruling out that the increase in homicide rates is not masking an increase in households' standard of living not fully captured by controlling by total expenditure (which would be underestimated) is important. The empirical evidence to date has, if anything, documented the opposite. Still, we may worry that households might be positively benefiting from the increase in illicit activities in their communities. In this case, self-reported income data may suffer from (under)reporting bias. The use of consumption data as opposed to self-reported income, however, should alleviate these concerns. In addition, in Appendix Table A17 shows that the increase in homicides rates does not predict any changes in household wealth or labor earnings. The rise in violence also does not have a statistical effect on the number or probability that any household member reports a "verbal-contract" informal job.

Male clothing and male labor supply The main results, and all the aforementioned robustness checks, show an increase in the budget share of adult male clothing, a male private assignable good. As discussed in the theoretical section, this reallocation of household expenditure can reflect a shift of intra-household bargaining power toward men. In section 5 , I provide empirical evidence of this mechanism.

An alternative explanation could be that changes in time allocation drive households' reallocation of resources toward male clothing. If households are responding to the increase in homicide rates with an increase in male labor supply, men might need to buy more clothing. Using the MxFLS survey, Velasquez (2019) finds no effect on working hours either among self-employed or wage-employed men. However, Brown and Velasquez (2017) document an increase in the number of high school drop-outs as a consequence of the increase in violence, which could be increasing the number of hours men work outside the household.

I present evidence that Velasquez 2019's results also hold within this paper's analytical sample (Table A21). I find no statistically significant effect on husbands' labor supply, either at the extensive or intensive margin. The total number of hours worked by all males in the household is also not affected by the rise in violence. Additionally, heterogeneous effects based on changes in male labor supply also suggest the results are not driven by men working more hours after the Mexican drug war.

5 The Effect on Intra-Household Bargaining Power

The results presented in section 4 are consistent with the increase in violence deteriorating women's intra-household bargaining power. Attanasio and Lechene (2010) show that the budget share of food is unchanged following the receipt of a large cash conditional transfer in Mexico, in contrast to what would be predicted by Engel's law. They rule out multiple mechanisms and argue the key is that the transfer is made to women, which changes the control over household resources. The increase in the budget share of male clothing is also consistent with increases in men's relative bargaining power inside the household. Clothing is a private assignable good and has been shown to be correlated with individuals' bargaining power in Mexico and other countries (Bobonis 2009).

Previous empirical evidence linking food and clothing expenditures to intra-household bargaining power rely on *distribution factors*. These factors are observables that affect individuals' bargaining power inside the household but are assumed to not affect preferences as well. We may worry this assumption might be less likely to hold when we discuss increases in violent crime in households' communities.

I illustrate theoretically why whether changes in homicides affect preferences of adult male clothing matters for the conclusions derived from the Engel curves results with respect to changes in intra-household bargaining power. I present comparative statistics with respect to violence of the Engel curves of male private assignable goods W_m^k specified in equation (13b).

Case 1. $\frac{\partial \alpha^m}{\partial H_j} = \frac{\partial \beta^m}{\partial H_j} = 0$. Changes in homicides do not affect preferences; they are *distribution factors*. Then, for any male private assignable luxury good m,

$$\frac{\partial W^m}{\partial H_j} = -\frac{\partial \eta}{\partial H_j}\left(\frac{W^m}{(1-\eta)} + \beta^m\right) \tag{17}$$

$$\frac{\partial W^m}{\partial H_j} \geq 0 \qquad \text{if and only if} \qquad \frac{\partial \eta}{\partial H_j} \leq 0. \tag{18}$$

The empirical results provide evidence of $\frac{\partial W^m}{\partial H_j} > 0$ in male clothing. Because the second term of equation (17) is positive (male clothing is a luxury good, $\beta^m > 0$), it must be that $\frac{\partial \eta}{\partial H_j} < 0$, that is the increase in violence decreases women's resource shares in the household (a proxy for bargaining power).

Case 2. $\frac{\partial \alpha^m}{\partial H_j} \leq 0$ and $\frac{\partial \beta^m}{\partial H_j} \leq 0$. Changes in violence may shift downward the intercept and slope of the Engel curves of male private goods. Then,

$$\frac{\partial W^m}{\partial H_j} = -\frac{\partial \eta}{\partial H_j}\left(\frac{W^m}{(1-\eta)} + \beta^m\right) + (1-\eta)\left(\frac{\partial \alpha^m}{\partial H_j} + \frac{\partial \beta^m}{\partial H_j}\ln((1-\eta)y/n^m)\right) \tag{19}$$

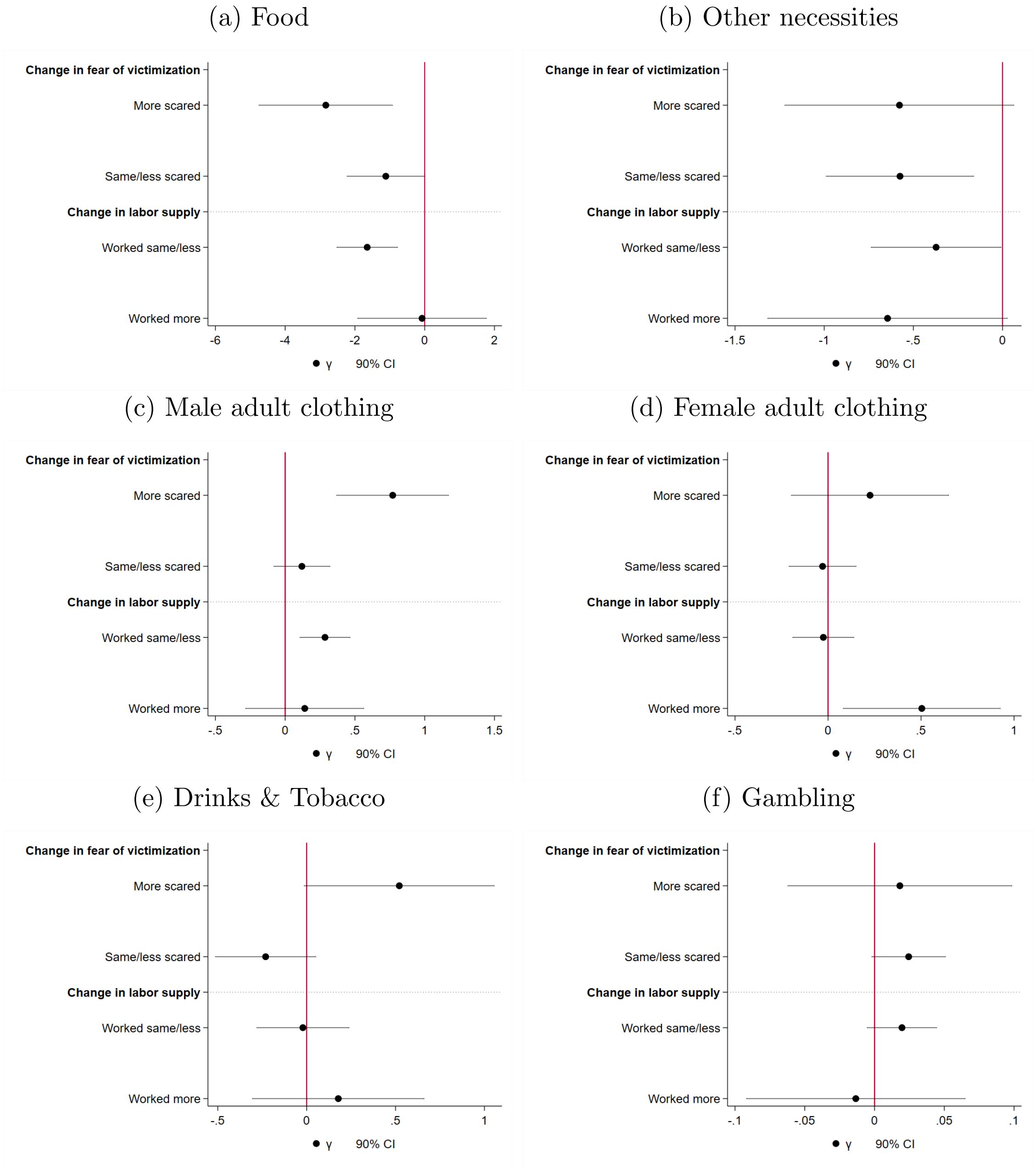
$$\frac{\partial W^m}{\partial H_j} \geq 0 \qquad \text{if and only if} \qquad \frac{\partial \eta}{\partial H_j} \leq 0. \tag{20}$$

Under these assumptions, the empirical results would still be supportive of increases in violent crime leading to increases in male bargaining power.

Case 3. $\frac{\partial \alpha^m}{\partial H_j} \geq 0$ or $\frac{\partial \beta^m}{\partial H_j} \geq 0$, with at least one of them with strict inequality. Changes in homicides may shift downward the intercept and slope of the Engel curves of male goods. Then, it may be the case that $\frac{\partial W^m}{\partial H_j} > 0$ and $\frac{\partial \eta}{\partial H_j} \geq 0$.

In the next three sections, I provide evidence in favor of the results been , at least partly, driven by declines in women's bargaining power. First, I document heterogeneous effects based on safety and women's labor supply consistent with a deterioration in women's outside options. Second, I structurally estimate the effect of homicide rates on women's resource shares, allowing for homicides to affect both preference and bargaining power parameters. Third, I provide evidence of a decrease in wives' intra-household decision-making power.

Figure 4: Heterogeneous Effects of Homicide Rates on Expenditure Shares



Notes: Figure 4 plots marginal effects of increases in homicide rates on expenditure shares. Each coefficient is estimated in a separate regression in which the sample is restricted to the categories reported in the left columns. Standard errors are clustered at the municipality level. The sample includes all nuclear households with children.

5.1 Heterogeneous Effects

Th Mexican drug war had a negative effect on female labor participation (Dell 2015, Velasquez 2019, Utar 2018). Velasquez (2019) finds a decrease in the number of hours worked among self-employed women within the MxFLS data. She includes both married and non-married women in the analysis. Importantly, she finds the negative effects on hours worked are much stronger for women who report fear of been assaulted, whereas these effects are not present for men.

These gendered impacts on labor participation, as discussed by Velasquez (2019), could be driven by women having a higher reservation wage when commuting to work becomes more dangerous. The opportunity cost to exit the labor place is generally lower for Mexican women because they tend not to be the main income earner in their household. In this paper's analytical sample, three fourths of the women were already not working prior to the escalation in violence.

In addition, women might be more scared than men of becoming victims of crime. In Table A19, I provide evidence that the increase in violence has induced greater fear of victimization in women than in men. I estimate individual fixed-effects regressions separately for women and men in the sample. The increase in homicides increases the probability that women are afraid to be attacked at night, lowers the probability of feeling safer than five years ago, and increases the probability of expecting an attack within the next three years. The increase in homicides also makes men feel less safe, but I find no statistically significant effect on how scared they are of been attacked. The point estimates are insignificant and smaller than women's across the board.

I split the sample based on the changes in women's fear of victimization and labor supply. Figure 4 reports heterogeneous effects of the Engel curves results.[33] The effect of homicides on food is present across the board except for those households in which women increased their number of hours worked after the escalation in violence.

[33] I present the results limiting the sample to nuclear households with children, but the results are very similar when keeping all households, and are available upon request.

The effect of homicides on male private clothing is twice as large in households where women report being more scared of victimization and is statistically insignificant in households where women work more than before. As in the main results, the increase in homicides does not increase female private clothing, except among those households where women increased their number of working hours. Interestingly, i find some evidence of an increase in the budget share of alcohol and tobacco in households where women report being more scared of crime than before.

These heterogeneous effects are in line with the impacts of crime on expenditure shares being, at least partially, explained by a deterioration in women's bargaining power. The increase in fear of victimization can be an important mechanism for lowering women's bargaining power even among those women who were not previously working. It may worsen women's options outside of marriage, because separation may be more costly. Additionally, the fear of going out can limit women's social networks, which has also been shown to be positively correlated with their bargaining power.

5.2 Structural Analysis of Intra-household Inequality

In this section, I estimate the effect of violent crime on intra-household bargaining power within a structural setup. The structural analysis allows changes in violence to affect both preferences and bargaining power parameters. I measure bargaining power through the identification of intra-household resource shares η.

Identification of the intra-household resource shares—the fraction of household expenditure consumed by each household member—will rely on the presence of private assignable goods. Male and female goods will comprise adult clothing and personal care goods.[34] The computation of resource shares will derive from the slope of the Engel specified in equations (13a) and (13b). In the absence of further

[34] Adult male clothing is defined as "Clothes and shoes for male adults such as: pants, shirts, sweaters, suites, underwear, etc". Male care goods is defined as "Men's personal effects such as: lotion, deodorant, razors, shaving foams, haircuts, etc.". Adult female clothing is defined as "Clothes and shoes for female adults such as: blouses, sweaters, skirts, underwear, pants, dresses, shoes, etc." Female care goods is defined as "Women's personal effects as: perfume, deodorant, cosmetics, feminine hygiene, face lotion, haircut, dyes, manicure, waxing, etc."

preference assumptions, the system of Engel curves specified in equations (13a, 13b) would consist of two Engel curves equations (women's and men's goods) and three unknown parameters: $\{\eta, \beta_m, \beta_w\}$. Identification is not possible without additional constraints. Dunbar, Lewbel, and Pendakur (2013) propose imposing similar preferences across members of the household restricting, $\beta_w = \beta_m = \beta$. The slopes of the system of Engel curves in equations (13a) and (13b) can be identified by linear regressions on an intercept and $\ln(y)$, and they are proportional to the resource share η.

I adapt the methodology proposed by Dunbar, Lewbel, and Pendakur (2013) to estimate resource shares to control for unobserved time-invariant heterogeneity with panel data. The direct inclusion of household fixed effects is not computationally feasible within a non-linear model with unobserved effects (Wooldridge 2001). Instead, I add Mundlak effects (see section 4.5.3). The empirical implementation is the following:

$$W_{it}^{w} = \eta(x_{it})[\alpha^{w}(x_{it}) + \beta(x_{it})[\ln(\eta(x_{it})) + \ln(y_{it}/n_{it}^{w})] + \theta^{w}\bar{x}_i] \tag{21a}$$

$$W_{it}^{m} = (1-\eta(x_{it}))[\alpha^{m}(x_{it}) + \beta(x_{it})[\ln(1-\eta(x_{it})) + \ln(y_{it}/n_{it}^{m}) + \theta^{m}\bar{x}_i] \tag{21b}$$

where W_{it}^{w} and W_{it}^{m} are the household budget shares spent on women's and male's private assignable goods, y_{it} is total household expenditure, n^{w} and n^{m} are the number of adult women and men in the household, respectively.

The proposed methodology by Dunbar, Lewbel, and Pendakur (2013) to estimate resource shares has been increasingly used to measure the levels and determinants of intra-household inequality. Calvi (2020) applies the methodology to estimate the age profile of women's resource shares in India to shed light on the phenomenon of elderly missing women. Brown, Calvi, and Penglase (2019) use the structural estimates of resource shares to measure intra-household consumption inequality in Bangladesh. Hoehn-Velasco and Penglase (2019) estimate resource shares to study the impact of unilateral divorce in women's bargaining power in Mexico. Sokullu and Valente (2018) estimate the impact of the Mexican Progresa cash conditional transfer on intra-household resource shares.

Budget shares versus resource shares The budget shares of the private assignable goods are not the same as the resource shares η. It is important to keep in mind that although imposing the same β restricts preference heterogeneity, it does not impose identical preferences across household members. If it did, $W_w^k > W_h^k$ would imply η must be greater than 0.5. This conclusion is not necessarily true when we just restrict the slope β. In Figure A5, for a hypothetical household with one adult woman and one adult man, I plot the hypothetical budget shares of two different goods against the resource share of the wife. The wife has a stronger preference for good 1 than her husband ($\alpha_w^1 > \alpha_h^1, \beta_w^1 = \beta_h^1$), and vice versa for good 2. We can see a range of η exists for which $\eta < 0.5$ and $W_w^1 > W_h^1$, and another where $\eta > 0.5$ and $W_w^2 < W_h^2$. Therefore, using $\frac{W_w^k}{W_h^k} \gtreqless 1$ to determine $\eta \gtreqless 0.5$ would not be correct unless we assume identical preferences, which highlights the need to estimate the resource shares within a structural setting; see Calvi (2020) for another example.

5.2.1 Estimation strategy and results

The model is implemented by adding an error term to equations (21a) and (21b) and estimated by the non-linear seemingly unrelated regression (SUR) method. The preference parameters $(\alpha^w, \alpha^m, \beta)$ are parametrized linear on a set of household time-varying controls, including the municipality-level homicide rate. Mundlak effects, $\bar{x}_i$ are averages across panels of all the included household characteristics. I also include survey wave, region, and rural locality fixed effects to account for price variation. I restrict the sample to households where both there are at least one female and one male above 18 years old.

I report the coefficients on the resource shares of the covariates (x_{it}) in Table 6. The effect of homicides on women's resource shares is negative. In households that experienced the average increase in crime during the period, women's resource shares are estimated to decrease by 5 percentage points. Columns (1) and (3) keep β constant across households and survey waves, whereas columns (2) and (4) parametrize it linearly on household time-varying controls, including the homicide rate, and a time fixed effect. Column (2), the preferred specification, keeps all households with children of the head of the household present. The coefficients of

Table 6: Determinants of Women's Resource Shares

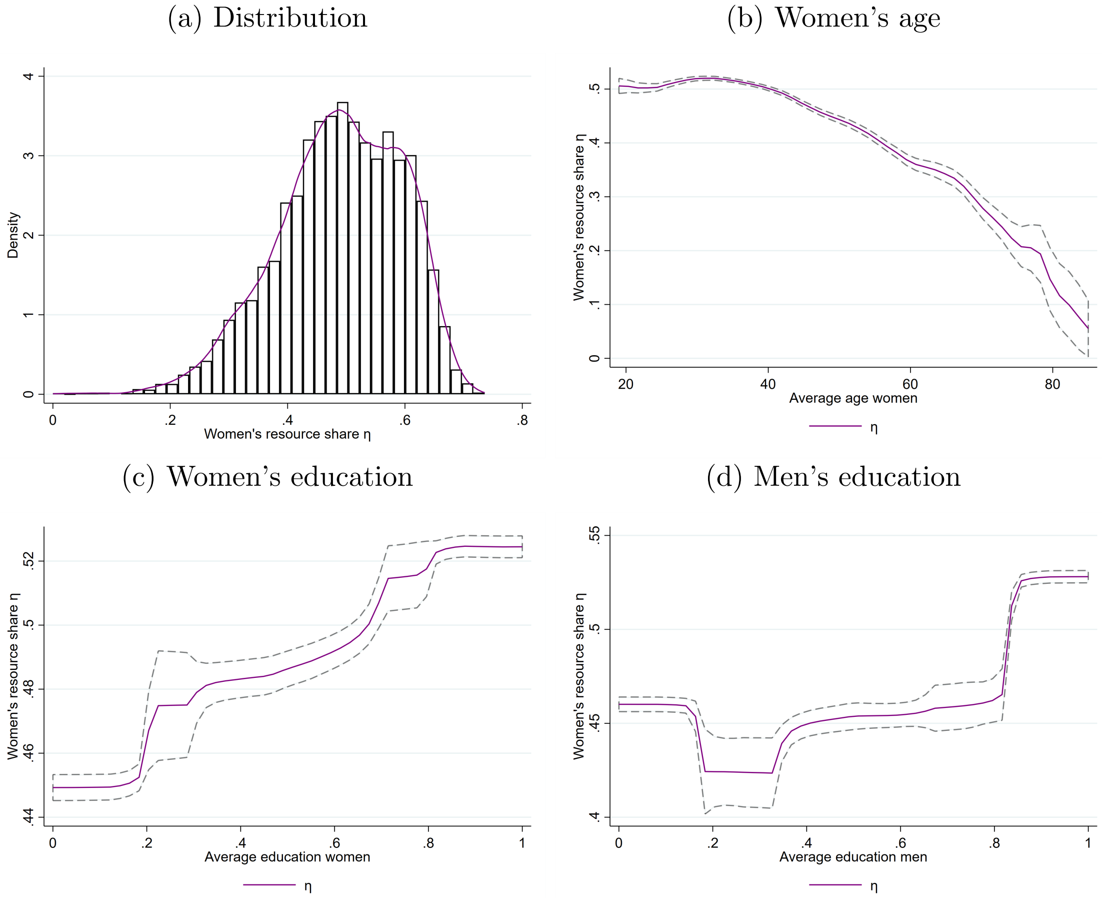
	(1)	(2)	(3)	(4)
	All households (with children)		All households	
	β	$\beta(x_{ijt})$	β	$\beta(x_{ijt})$
$\sqrt[4]{}$ Homicide rate last 12 months	-0.02	-0.03**	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Intercept	0.45***	0.31**	0.51***	0.48***
	(0.15)	(0.15)	(0.12)	(0.12)
MxFLS3	-0.03	-0.05**	-0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Average age all adult women	0.00	0.01	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Average age all adult women squared	-0.00	-0.00*	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Average age all adult men	0.00	0.01*	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Average age all adult men squared	-0.00	-0.00*	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Average education adult women	-0.01	0.03	0.01	-0.03
	(0.02)	(0.02)	(0.03)	(0.03)
Average education adult men	0.07**	0.04	0.05	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
# household members <=18	0.01	0.00	0.01*	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Rural locality	-0.12***	-0.11***	-0.12***	-0.10***
	(0.03)	(0.02)	(0.03)	(0.02)
Central region	0.04	0.03	0.02	0.04
	(0.04)	(0.04)	(0.03)	(0.03)
North region	-0.11***	-0.13***	-0.10***	-0.09***
	(0.04)	(0.04)	(0.03)	(0.03)
West region	0.03	-0.01	-0.00	-0.00
	(0.04)	(0.04)	(0.04)	(0.03)
Observations	7,106	7,106	8,376	8,376
Mundlak effects	✓	✓	✓	✓
β	Constant	x_{ijt}	Constant	x_{ijt}

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Estimates are based the implementation of non-linear seemingly unrelated regression clustering standard errors at the municipality level. Columns (1) and (2) include all households with children from head of the household present. Columns (3) and (4) include all households. Columns (1) and (3) treat β as a constant parameter. Columns (2) and (4) parametrize β as a function of household controls including Mundlak effects, survey fixed effects, and the time-varying household controls specified in Table 6.

the household characteristics on the preference parameters $\alpha^w, \alpha^m, \beta$ are available upon request.

Figure 5 plots the distribution of the average predicted resource shares and the resource shares against household characteristics. Reassuringly, they are all within 0 and 1, even though they were not forced in the estimation. The average women's resource share is 0.48. Consistent with previous research, women's resource shares are positively correlated with the levels of education, are lower in rural areas, and their relationship with age is U-shaped (Calvi 2020).

Figure 5: Average Predicted Women's Resource Shares



Notes: The figure plots the average predicted women's resource share. Figure 5a plots the distribution of the average predicted shares. Figures 5b, 5c, 5d show women's average resource shares against the average age of women in the household, the proportion of female adults with a secondary education, and the proportion of male adults with a secondary education, respectively. The dashed lines are 95% confidence intervals. Estimates come from column (2) of Table 6.

5.3 The Effect on Intra-household Decision-Making

In this section, I provide further evidence of the negative effects of local violence on women's decision-making in the household driving the effects on consumption allocations. The MxFLS asks the head of the household and the spouse separately who generally makes the decisions regarding different household purchases.[35] They are allowed to select multiple people. I build two indicator variables based on the wife's and husband's responses with respect to decision m. $DM_i^m = \mathbb{1}\{i \text{ says } i \text{ decides over } m\}$ and $SD_i^m = \mathbb{1}\{i \text{ says spouse decides over } m \text{ and } i \text{ does not}\}$.

The recent literature on women's empowerment shows intra-household disagreements over decisions also matter for women's well-being and their children. Women "taking power" versus "given power" seems to capture an important aspect of empowerment. Following Annan et al. (2019), I define "taking power"(TP_i^m) as the respondent declaring sole or joint decision-making power and the spouse disagreeing. "Given power"(GP_i^m) is defined as the spouse reporting higher decision-making for the respondent than this one does for herself. Evidence has shown these types of spousal disagreements are not random and are correlated with bargaining power.

I estimate the effect of homicide rates on intra-household decision-making power with the following specification:

$$Y_{ijt}^m = \alpha^m + \gamma^m H_{jt} + \Theta^m D_{ijt} + \lambda_t^m + \delta_i^m + \epsilon_{ijt}^m$$

where $Y_{ijt}^m \in \{DM_{ijt}^m, TP_{ijt}^m, GP_{ijt}^m\}$ of person i living in municipality j and year t deciding over m. The coefficient of interest is γ^m and H_{jt} is the quartic root of the homicide rate per 100,000 people over the last 12 months prior to the interview. D_{ijt} is a vector of time-variant individual characteristics; δ_i^m is an individual fixed effect that controls for both time-invariant individual and municipality characteristics given the intention-to-treat approach; λ_t^m is a year-of-interview fixed effect; and

[35] Tsaneva, Rockmore, and Albohmood (2018) find a negative effect of the increase in violence on female self-reported decision making within Mexican households. Chakraborty and De (2017) use the MxFLS survey and document a positive correlation between female decision-making and higher secondary enrollment for boys.

Table 7: Effect of Homicide Rates on Intra-Household Decision-Making

	(1) Wife says she is decision-maker	(2) Wife says husband is main decision-maker and she is not	(3) Husband says he is decision-maker	(4) Husband says wife is main decision-maker and he is not
Food eaten in the house	-0.014	0.013*	0.022	-0.022
	(0.009)	(0.007)	(0.024)	(0.025)
Wife's clothes	-0.018**	0.020***	-0.012	0.022
	(0.008)	(0.007)	(0.025)	(0.025)
Husband's clothes	-0.046**	0.051**	0.037***	-0.035***
	(0.022)	(0.022)	(0.012)	(0.012)
Large expenditures	-0.043**	0.051***	0.006	-0.001
	(0.019)	(0.019)	(0.011)	(0.008)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All regressions have 2,789 observations. Each number is the coefficient of the quartic root of the homicide rate of a different regression whose outcome variable is described by the column with respect to the decision described in the row. The column (1) outcome variable is equal to 1 if the wife reports being the decision-maker solely or jointly with her husband, and possibly with others. The column (2) outcome variable is equal to 1 if the wife reports not being the decision-maker but says her husband is. The column (3) outcome variable is equal to 1 if the husband reports being the decision-maker solely or jointly with his wife, and possibly with others. The column (4) outcome variable is equal to 1 if the husband reports not being the decision-maker but says his wife is.

ϵ_{ijt}^{m} is a conditionally mean-zero error clustered at the municipality level.

The results are consistent with the effects found on consumption allocations and women's resource shares. Table 7 presents the results of the effects of the increase in homicides on wives' and husbands' self-assessment of their own decision-making power. Only households in which both the wife and the husband answered the decision-making module are included. The results show a negative effect on the probability of women reporting they are the main or joint decision-maker in several household purchases categories: food eaten in the house, her clothes, her spouse's clothes, and large purchases for the household. I find the opposite effect on the probability of women reporting their husbands are the decision-makers and not them. The changes in violence do not seem to have an effect on men's perceptions except regarding their own clothing. They are more likely to say they make decisions over their own clothes and their wives do not.

Table A22 presents the results of the effects of an increase in homicides on the directionality of spousal disagreements. The results are consistent with the conclusions drawn from Table 7. The increase in violence increases the probability of women being "given power" from their husbands with respect to food and their own clothing. Importantly, I find no effect on spousal disagreements with respect to male clothing, because they both declare a shift toward men having more power as violence increased.

The results are also important quantitatively. A woman living in a municipality that had no violence exposure in 2005–2006, and then experienced the average annual homicide rate rise between the two survey waves, is 10 percentage points more likely to report having lost her decision-making power to her husband with respect to male clothing and large expenditures in the household; this number is 2.55 percentage points with respect to food eaten in the household and 3.94 percentage points with respect to their own clothing expenses. A man living in a municipality that had no violence exposure in 2005–2006, and then experienced the average annual homicide rate rise, is 7.28 percentage points more likely to report their wives have lost decision-making power to them with respect to his clothing.

6 Conclusion

This paper presents evidence that changes in violent crime can significantly affect households' behavior, and the effects are not gender neutral. I do so in the context of an unprecedented and unanticipated surge in violent crime in Mexico in the late 2000s. I estimate causal estimates using a rich longitudinal survey that follows the same households before and after the escalation in violence. Understanding gendered effects of crime are key for effective policy design. The treatment effects of cash conditional transfers and other anti-poverty programs may be heterogeneous by women's exposure to violence in different parts of the world.

The increase in violence had an effect on the composition of household expenditures. The results suggest increases in homicides shifted the household Engel curves of food and other necessities (hygiene and personal care items) downward, while increasing the share of household expenditures allocated to private male clothing and gambling. The reported impacts on consumption allocations, as well as heterogeneous effects, are consistent with a deterioration in women's bargaining power. But previous research in Mexico and other developing countries has mostly relied on distribution factors. These factors are variables assumed to alter bargaining power but not preferences. To address this concern in the context of community violence, I compute the effect of violence on women's bargaining power through the estimation of intra-household resource shares, defined as the fraction of the total household budget that individuals consume, within a structural model. Finally, negative impacts on women's intra-household decision making further confirm the findings.

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A Appendix

A.1 Additional Tables

Table A1: Descriptive Statistics: Household Characteristics in 2005–2006. Nuclear Households with Children.

	Mean and standard deviation	**Violence variables** $\sqrt[4]{H_{m2005}}$	ΔH_m	$\Delta \sqrt[4]{H_m}$
	(1)	(2)	(3)	(4)
Wife's age	38.37	-0.56	-0.02*	0.08
	[11.08]	(0.37)	(0.01)	(0.34)
Husband's age	41.62	-0.67	-0.02	0.26
	[12.03]	(0.44)	(0.01)	(0.45)
Age gap	3.25	-0.11	0.00	0.18
	[5.17]	(0.19)	(0.01)	(0.25)
Wife's secondary	0.47	0.06***	0.00	-0.00
	[0.50]	(0.02)	(0.00)	(0.02)
Husband's secondary	0.49	0.05**	0.00	-0.01
	[0.50]	(0.02)	(0.00)	(0.02)
Number of children	2.56	-0.06	-0.00	-0.02
	[1.35]	(0.07)	(0.00)	(0.06)
Average age children	12.06	-0.31	-0.01	0.13
	[8.11]	(0.26)	(0.01)	(0.23)
Share of daughters	0.49	0.01	-0.00	-0.01
	[0.36]	(0.01)	(0.00)	(0.01)
Rural locality	0.40	-0.14***	-0.00	0.08
	[0.49]	(0.05)	(0.00)	(0.05)
Household size	4.56	-0.06	-0.00	-0.02
	[1.35]	(0.07)	(0.00)	(0.06)
Domestic partnership	0.15	-0.00	0.00	0.01
	[0.36]	(0.02)	(0.00)	(0.01)
Observations	2,813	2,813	2,813	2,813
Joint equality test (p-value)		0.10	0.60	0.74

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column (1) presents sample means and standard deviations, in brackets, of the analytical sample in MxFLS-2. Columns (2) - (4) are calculated with OLS and clustering standard errors (in parentheses) at the municipality level. Column (2) reports the OLS coefficient of a regression of the household characteristic on the homicide rate in 2005–2006 MxFLS-2. Column (3) reports an OLS coefficient of a regresion of the household characteristic on the increase in the homicide rate between MxFLS-2 and MxFLS-3. Column (4) also reports an OLS coefficient, but of the increase in the quartic root of the homicide rate.

Table A2: MxFLS Expenditure Data: Good Categories

Good category	**Recall period**	**Description**
Food	7 days	Vegetables and fruits, cereals and grains, meats and other animal originated food, other processed food and drinks.
Drinks & Tobacco	7 days	Juices, purified water, beverages such as beer, tequila, rum, and powder for preparing water, cigarettes and tobacco.
Male adult clothing	3 months	Clothes and shoes for male adults such as: pants, shirts, sweaters, suits, underwear, etc.
Female adult clothing	3 months	Clothes and shoes for female adults such as: blouses, sweaters, skirts, underwear, pants, dresses, shoes etc.
Children goods	1 month / 3 months	Clothes and shoes for boys and girls (excluding school uniforms). Toys in general, baby clothes and baby items such as: clothes, daycares, baby bottles, carriages, bath tubs, etc.
Hygiene and personal care	1 month	toothpaste, shampoo, tissues, toilet paper, lotion, deodorant, shaving foam, haircuts, etc.
Other household goods	1month & 3 months & 1 year	detergents, cleaners, light bulbs, brooms, candles, bar of soap, bleaches, glass lampshades, domestic service, laundry, dry cleaner's shop, tableware, dishes, glasses, pots, bedspreads, bed sheets, pillows, yarn, needles, any other domestic utensils, etc. Utilities: water, electricity, gas, garbage collection, firewood, coal, petroleum, telephone, telegraph, money orders, postage stamps, internet, etc. Value of gifts given to others. Property or income taxes. Funerals, vacations, parties, insurances, moving costs, other transportation services, and other expenditures.
Transportation	7 days/3 months	Transportation such as: bus, subway, taxi, and/or gasoline. Maintenance services for vehicles such as: fuel, oil, lubricants, pension, parking, car wash, mechanical shops, appliances, auto parts, etc.
Health	3 months	Healthcare and health services such as: medicine, medical and dental visits, hospitalization, etc.
Education	Current school period	Enrollments fees, exam fees, shcool supplies, uniforms, school transportation.
Recreation	7 days& 1 month	Food and drinks consumed outside the household. Culture and recreation as: books, magazines, newspapers, records, excursions, fairs, etc.
Gambling	1 month	Lottery and other such games of chance.

Table A3: Descriptive Statistics: Households Expenditures in 2005–2006. Nuclear Households with Children.

	Mean and standard deviation	Violence variables		
		$\sqrt[4]{H_{m2005}}$	ΔH_m	$\Delta \sqrt[4]{H_m}$
	(1)	(2)	(3)	(4)
Total expenditure	61,464.64	3,490.74	76.83	1,126.71
	[46,538.27]	(2,410.92)	(77.05)	(2,330.99)
Ln(total expenditure)	10.78	0.06	0.00*	0.04
	[0.71]	(0.04)	(0.00)	(0.04)
Food	55.11	-1.22	0.03	1.29
	[18.09]	(0.93)	(0.03)	(0.86)
Drinks and Tob.	3.40	-0.05	0.01**	0.28*
	[4.02]	(0.18)	(0.01)	(0.17)
Male adult clothing	1.51	0.09	-0.00*	-0.10
	[2.65]	(0.08)	(0.00)	(0.07)
Female adult clothing	1.52	-0.01	-0.00	-0.04
	[2.67]	(0.09)	(0.00)	(0.07)
Children goods	2.26	-0.10	0.00	0.05
	[3.62]	(0.13)	(0.00)	(0.14)
Hygiene, personal care	5.96	-0.10	0.00	0.02
	[4.90]	(0.21)	(0.01)	(0.13)
Other household goods	12.69	0.30	-0.01	-0.32
	[9.35]	(0.38)	(0.01)	(0.31)
Transportation	8.06	0.22	-0.00	-0.22
	[9.81]	(0.36)	(0.01)	(0.39)
Health	1.64	0.01	-0.01	-0.15
	[5.20]	(0.19)	(0.00)	(0.18)
Education	5.00	0.53*	-0.02***	-0.62**
	[9.60]	(0.28)	(0.01)	(0.24)
Recreation	2.81	0.32	-0.01	-0.17
	[6.58]	(0.20)	(0.01)	(0.20)
Gambling	0.05	0.03**	-0.00	-0.03**
	[0.47]	(0.01)	(0.00)	(0.01)
Shares joint eq. test (p)		0.14	0.07	0.02
Observations	2,813	2,813	2,813	2,813

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns (1) presents sample means and standard deviations, in brackets, of the analytical sample in MxFLS-2. Columns (2) - (4) are calculated with OLS and clustering standard errors (in parentheses) at the municipality level. Column (2) reports the OLS coefficient of a regression of the expenditure share on the homicide rate in 2005–2006 MxFLS-2. Column (3) reports an OLS coefficient of a regresion of the expenditure share on the increase in the homicide rate between MxFLS-2 and MxFLS-3. Column (4) also reports an OLS coefficient but of the increase in the quartic root of the homicide rate.

Table A4: Effect of Homicide Rates on Expenditure Shares: Nuclear Households

		(1)	(2)	(3)
Food	ln(total expenditure)	-18.21***	-18.01***	-17.19***
		(4.88)	(4.77)	(4.71)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-1.66**	-1.33*	-1.69**
		(0.76)	(0.71)	(0.85)
Drinks and Tobacco	ln(total expenditure)	-2.08*	-1.90*	-1.77*
		(1.08)	(1.04)	(1.07)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.07	-0.15	-0.31
		(0.20)	(0.20)	(0.23)
Male clothing	ln(total expenditure)	0.99	0.99	1.02*
		(0.65)	(0.60)	(0.57)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.30***	0.31***	0.19
		(0.11)	(0.10)	(0.12)
Female clothing	ln(total expenditure)	1.57**	1.47**	1.53**
		(0.74)	(0.68)	(0.67)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.21	0.24*	0.22
		(0.13)	(0.13)	(0.17)
Children goods	ln(total expenditure)	2.56*	2.13	2.14
		(1.34)	(1.32)	(1.40)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.04	0.05	0.12
		(0.20)	(0.19)	(0.25)
Hygiene and care	ln(total expenditure)	-1.22	-0.72	-0.80
		(1.50)	(1.34)	(1.39)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.38	-0.30	-0.14
		(0.29)	(0.26)	(0.32)
Other hh goods	ln(total expenditure)	5.92**	6.04**	5.67**
		(2.74)	(2.82)	(2.75)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.26	0.25	0.11
		(0.46)	(0.39)	(0.46)
Transportation	ln(total expenditure)	5.45**	5.67**	5.58**
		(2.59)	(2.70)	(2.72)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.38	0.35	0.98
		(0.53)	(0.59)	(0.71)
Health	ln(total expenditure)	2.56**	2.09	2.07
		(1.26)	(1.30)	(1.34)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.50*	0.34	0.11
		(0.29)	(0.29)	(0.40)
Education	ln(total expenditure)	0.48	0.53	0.38
		(0.79)	(0.72)	(0.75)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.08	-0.07	0.16
		(0.20)	(0.20)	(0.20)
Recreation	ln(total expenditure)	2.11	1.84	1.61
		(1.79)	(1.82)	(1.91)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.47	0.38	0.11
		(0.40)	(0.37)	(0.37)
Gambling	ln(total expenditure)	-0.13	-0.11	-0.18
		(0.20)	(0.18)	(0.25)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.02	0.01	0.03
		(0.03)	(0.02)	(0.03)
	Household controls	✓	✓	✓
	Month and year of interview FE	✓	✓	✓
	Instrument expenditure	✓	✓	✓
	Household FE	✓	✓	✓
	Double Lasso		✓	✓
	Price proxy			✓
	Observations	2,802	2,802	2,802

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A5: Expenditure Elasticities

	All households			Nuclear households		
		95% Confidence Interval			95% Confidence Interval	
	Elasticity	Lower bound	Upper bound	Elasticity	Lower bound	Upper bound
Food	0.71	0.58	0.84	0.68	0.51	0.85
Drinks and Tobacco	0.96	0.43	1.48	0.38	-0.25	1.01
Male adult clothing	2.41	1.51	3.32	1.73	0.79	2.67
Female adult clothing	1.92	0.83	3.02	2.09	1.08	3.10
Children goods	1.67	0.84	2.50	2.45	0.96	3.93
Hygiene and care	0.73	0.31	1.16	0.79	0.29	1.29
Other hh goods	1.09	0.74	1.44	1.43	1.04	1.83
Transportation	1.88	1.40	2.36	1.58	1.04	2.13
Health	1.48	0.39	2.56	2.52	1.05	3.99
Education	1.22	0.59	1.85	1.22	0.51	1.94
Recreation	2.38	1.30	3.47	1.93	0.38	3.49
Gambling	2.99	-0.35	6.33	-1.14	-7.86	5.58

Notes: the elasticities are calculated as $1 + \frac{\beta^k}{W^k}$, with W^k equal to the average budget share for good k across the two survey waves. The estimates come from Column (2) of Tables 5 and A4.

Table A6: Effect of Homicide Rates within Food Basket

		(1)	(2)	(3)	(4)
		All households		Nuclear with children	
Fruit & Veg.	**ln(food expenditure)**	-0.0212***	-0.0247	-0.0180***	-0.0945
		(0.0036)	(0.0350)	(0.0045)	(0.0615)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.0021	-0.0022	-0.0038	-0.0065
		(0.0024)	(0.0030)	(0.0029)	(0.0043)
Cereals & Grains	**ln(food expenditure)**	-0.0233***	-0.0454	-0.0251***	-0.0390
		(0.0041)	(0.0337)	(0.0051)	(0.0571)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.0018	-0.0025	-0.0024	-0.0029
		(0.0029)	(0.0045)	(0.0033)	(0.0049)
Meat & Dairy	**ln(food expenditure)**	0.0530***	0.0269	0.0500***	0.1047
		(0.0050)	(0.0460)	(0.0063)	(0.0778)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.0021	0.0012	0.0069*	0.0088*
		(0.0033)	(0.0039)	(0.0037)	(0.0053)
Other food	**ln(food expenditure)**	-0.0084**	0.0432	-0.0068	0.0288
		(0.0037)	(0.0308)	(0.0043)	(0.0578)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.0017	0.0034	-0.0006	0.0006
		(0.0024)	(0.0028)	(0.0029)	(0.0035)
	Household controls	✓	✓	✓	✓
	Month and year of interview FE	✓	✓	✓	✓
	Household FE	✓	✓	✓	✓
	Instrument expenditure		✓		✓
	Observations	4,250	8,502	2,812	5,626

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A7: Effect of Homicide Rates on Food Type Budget Shares

		(1)	(2)	(3)	(4)
		All households		Nuclear with children	
Fruit & Veg.	ln(total expenditure)	-4.30**	-4.24**	-7.65***	-7.62***
		(1.74)	(1.69)	(2.32)	(2.30)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.26	-0.25	-0.40	-0.35
		(0.20)	(0.19)	(0.26)	(0.22)
Cereals & Grains	ln(total expenditure)	-4.91***	-4.83***	-4.81**	-4.75**
		(1.52)	(1.45)	(2.38)	(2.28)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.35	-0.37	-0.42	-0.48*
		(0.30)	(0.28)	(0.28)	(0.28)
Meat & Dairy	ln(total expenditure)	-7.14**	-7.14**	-6.77	-7.44*
		(2.96)	(2.91)	(4.19)	(4.10)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.46	-0.47	-0.32	-0.36
		(0.31)	(0.34)	(0.39)	(0.41)
Other food	ln(total expenditure)	-0.32	-0.15	-2.33	-2.11
		(1.27)	(1.16)	(1.78)	(1.69)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.07	-0.08	-0.30	-0.26
		(0.18)	(0.17)	(0.21)	(0.20)
Drinks and Tobacco	ln(total expenditure)	-0.14	-0.03	0.61	0.67
		(0.90)	(0.91)	(1.34)	(1.32)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.06	0.05	0.01	-0.00
		(0.14)	(0.14)	(0.13)	(0.13)
Male clothing	ln(total expenditure)	1.92***	2.02***	1.22**	1.28**
		(0.63)	(0.63)	(0.62)	(0.64)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.23***	0.20***	0.24***	0.23***
		(0.08)	(0.07)	(0.09)	(0.08)
Female clothing	ln(total expenditure)	1.33*	1.29	0.86	0.86
		(0.80)	(0.79)	(1.06)	(1.06)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.07	0.06	0.06	0.08
		(0.07)	(0.07)	(0.10)	(0.09)
Children goods	ln(total expenditure)	1.19	1.11	2.04	1.80
		(0.75)	(0.72)	(1.25)	(1.18)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.06	-0.07	-0.10	-0.13
		(0.14)	(0.14)	(0.19)	(0.19)
Hygiene and care	ln(total expenditure)	-1.57	-1.44	-0.97	-0.58
		(1.27)	(1.21)	(1.77)	(1.73)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	-0.45**	-0.42**	-0.38*	-0.36*
		(0.17)	(0.17)	(0.20)	(0.20)
Other hh goods	ln(total expenditure)	1.24	1.21	4.85	4.87
		(2.45)	(2.43)	(3.34)	(3.33)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.20	0.26	0.58*	0.56*
		(0.31)	(0.29)	(0.35)	(0.31)
Transportation	ln(total expenditure)	8.18***	7.92***	7.86**	7.92**
		(2.29)	(2.21)	(3.72)	(3.55)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.61**	0.62**	0.38	0.44
		(0.29)	(0.30)	(0.37)	(0.36)
Health	ln(total expenditure)	0.80	0.64	2.05*	2.13*
		(0.94)	(0.89)	(1.14)	(1.18)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.24	0.27*	0.21	0.16
		(0.16)	(0.15)	(0.21)	(0.21)
Education	ln(total expenditure)	0.48	0.32	0.34	0.24
		(0.70)	(0.66)	(1.22)	(1.16)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.08	0.08	0.08	0.13
		(0.09)	(0.09)	(0.13)	(0.13)
Recreation	ln(total expenditure)	3.12**	2.87**	2.59	2.55
		(1.25)	(1.21)	(2.06)	(2.08)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.15	0.14	0.32	0.30
		(0.19)	(0.18)	(0.23)	(0.22)
Gambling	ln(total expenditure)	0.12	0.14	0.10	0.14
		(0.10)	(0.09)	(0.20)	(0.19)
	$\sqrt[4]{\text{Homicide rate last 12 months}}$	0.02*	0.02*	0.02	0.02
		(0.01)	(0.01)	(0.02)	(0.01)
	Household controls	✓	✓	✓	✓
	Month and year of interview FE	✓	✓	✓	✓
	Instrument expenditure	✓	✓	✓	✓
	Household FE	✓	✓	✓	✓
	Double Lasso		✓		✓
	Observations	8,502	8,502	5,626	5,626

Notes:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A8: Engel Curves: Coefficients on Log Expenditure; Household, Male, and Female Care Goods

	(1)	(2)	(3)	(4)
Food	-12.68***	-16.68***	-16.36***	-16.41***
	(0.59)	(3.75)	(3.66)	(3.88)
Drinks and Tobacco	-0.25*	-0.14	-0.03	-0.01
	(0.14)	(0.90)	(0.91)	(0.97)
Male clothing	0.68***	1.92***	2.02***	2.02***
	(0.10)	(0.63)	(0.63)	(0.65)
Female clothing	0.71***	1.33*	1.28	1.18
	(0.10)	(0.80)	(0.79)	(0.82)
Male care goods	0.07	0.96**	0.96***	0.90***
	(0.07)	(0.39)	(0.36)	(0.35)
Women care goods	0.03	-0.34	-0.32	-0.34
	(0.07)	(0.48)	(0.44)	(0.46)
Children goods	0.49***	1.19	1.11	1.10
	(0.15)	(0.75)	(0.71)	(0.77)
Hygiene and care	-0.73***	-2.18**	-2.08**	-2.11**
	(0.11)	(0.97)	(0.96)	(1.00)
Other hh goods	1.69***	1.24	1.21	1.06
	(0.48)	(2.45)	(2.43)	(2.57)
Transportation	6.42***	8.18***	7.92***	8.39***
	(0.41)	(2.29)	(2.21)	(2.34)
Health	1.73***	0.80	0.64	0.57
	(0.23)	(0.94)	(0.89)	(0.93)
Education	-0.55***	0.48	0.33	0.31
	(0.10)	(0.70)	(0.67)	(0.71)
Recreation	2.31***	3.12**	2.87**	2.85**
	(0.18)	(1.25)	(1.21)	(1.25)
Gambling	0.08**	0.12	0.14	0.16
	(0.03)	(0.10)	(0.09)	(0.10)
Household controls	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Instrument expenditure		✓	✓	✓
Double Lasso			✓	✓
Price proxy				✓
Observations	4,251	4,251	4,251	4,251

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table 4 reports coefficient β^k on $\ln(y)$ of each demand equation (15). Estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure multiplied by 100. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A9: Effect of Homicide Rates on Expenditure Shares: Household, Male, and Female Care Goods

	(1)	(2)	(3)	(4)
Food	-1.07**	-1.15**	-1.18**	-0.93*
	(0.45)	(0.49)	(0.48)	(0.54)
Drinks and Tobacco	0.05	0.06	0.05	-0.21
	(0.14)	(0.14)	(0.14)	(0.19)
Male clothing	0.21***	0.23***	0.20***	0.23***
	(0.06)	(0.08)	(0.07)	(0.08)
Female clothing	0.06	0.07	0.06	0.06
	(0.07)	(0.07)	(0.07)	(0.09)
Male care goods	-0.10*	-0.08	-0.10*	-0.06
	(0.05)	(0.06)	(0.05)	(0.06)
Women care goods	-0.12**	-0.13**	-0.12*	-0.10
	(0.06)	(0.06)	(0.07)	(0.08)
Children goods	-0.07	-0.06	-0.08	0.03
	(0.13)	(0.14)	(0.14)	(0.16)
Hygiene and care	-0.21**	-0.24*	-0.19	-0.20
	(0.11)	(0.12)	(0.12)	(0.12)
Other hh goods	0.20	0.20	0.26	-0.03
	(0.27)	(0.31)	(0.29)	(0.36)
Transportation	0.58**	0.61**	0.62**	0.93***
	(0.29)	(0.29)	(0.30)	(0.32)
Health	0.26*	0.24	0.27*	0.25
	(0.15)	(0.16)	(0.15)	(0.21)
Education	0.06	0.08	0.08	0.11
	(0.08)	(0.09)	(0.09)	(0.10)
Recreation	0.13	0.15	0.13	-0.09
	(0.17)	(0.19)	(0.18)	(0.19)
Gambling	0.02*	0.02*	0.02*	0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Household controls	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Instrument expenditure		✓	✓	✓
Double Lasso			✓	✓
Price proxy				✓
Observations	4,251	4,251	4,251	4,251

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table 4 reports coefficient γ^k on the quartic of the homicide rate in 100,000 of each equation (15). Estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure multiplied by 100. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A10: MxFLS Wave 1 and Wave 2 Placebo Test

		(1)	(2)	(3)	(4)
		All households		Nuclear with children	
Food	ln(total expenditure)	-10.53***	-19.56***	-10.61***	-17.23***
		(0.67)	(5.44)	(0.68)	(5.24)
	∜ Homicide rate last 12 months	1.01	1.54*	0.89	1.21
		(0.67)	(0.80)	(0.79)	(0.89)
Drinks and Tobacco	ln(total expenditure)	-0.35**	0.98	-0.30	1.43
		(0.17)	(1.34)	(0.20)	(1.32)
	∜ Homicide rate last 12 months	-0.10	-0.18	-0.14	-0.23
		(0.19)	(0.19)	(0.17)	(0.18)
Male clothing	ln(total expenditure)	0.70***	2.74***	0.72***	1.55**
		(0.10)	(0.85)	(0.12)	(0.75)
	∜ Homicide rate last 12 months	-0.04	-0.16	-0.03	-0.07
		(0.10)	(0.12)	(0.12)	(0.13)
Female clothing	ln(total expenditure)	0.60***	1.04	0.59***	0.91
		(0.08)	(0.68)	(0.09)	(0.75)
	∜ Homicide rate last 12 months	-0.05	-0.08	-0.08	-0.09
		(0.11)	(0.12)	(0.12)	(0.13)
Children goods	ln(total expenditure)	0.44***	0.28	0.42***	0.68
		(0.12)	(0.96)	(0.15)	(1.22)
	∜ Homicide rate last 12 months	-0.24	-0.23	-0.32	-0.33
		(0.15)	(0.17)	(0.21)	(0.23)
Hygiene and care	ln(total expenditure)	-0.90***	-1.77	-1.15***	-1.91
		(0.17)	(1.62)	(0.22)	(1.53)
	∜ Homicide rate last 12 months	-0.01	0.04	-0.01	0.03
		(0.19)	(0.23)	(0.21)	(0.24)
Other hh goods	ln(total expenditure)	0.19	5.35*	-0.17	4.55
		(0.40)	(2.94)	(0.41)	(3.49)
	∜ Homicide rate last 12 months	-0.26	-0.56	-0.01	-0.24
		(0.46)	(0.59)	(0.45)	(0.60)
Transportation	ln(total expenditure)	6.01***	8.58***	6.35***	9.45***
		(0.42)	(3.25)	(0.53)	(3.34)
	∜ Homicide rate last 12 months	0.02	-0.13	-0.04	-0.19
		(0.40)	(0.47)	(0.56)	(0.61)
Health	ln(total expenditure)	1.85***	-0.63	1.70***	-1.34
		(0.27)	(1.46)	(0.33)	(1.67)
	∜ Homicide rate last 12 months	-0.07	0.07	0.18	0.33
		(0.20)	(0.26)	(0.24)	(0.32)
Education	ln(total expenditure)	-0.42***	0.12	-0.51***	-0.20
		(0.11)	(1.23)	(0.15)	(1.56)
	∜ Homicide rate last 12 months	-0.18*	-0.22*	-0.28**	-0.29*
		(0.10)	(0.12)	(0.12)	(0.15)
Recreation	ln(total expenditure)	2.33***	2.63	2.88***	1.65
		(0.21)	(1.65)	(0.29)	(1.99)
	∜ Homicide rate last 12 months	-0.05	-0.07	-0.16	-0.10
		(0.14)	(0.18)	(0.19)	(0.23)
Gambling	ln(total expenditure)	0.07***	0.22	0.08**	0.46
		(0.02)	(0.20)	(0.03)	(0.29)
	∜ Homicide rate last 12 months	-0.01	-0.02	-0.00	-0.02
		(0.01)	(0.02)	(0.02)	(0.03)
	Household controls	✓	✓	✓	✓
	Month and year of interview FE	✓	✓	✓	✓
	Household FE	✓	✓	✓	✓
	Instrument expenditure		✓		✓
	Observations	8,926	8,926	5,552	5,552

Notes:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Estimates based on a system of linear equations clustering standard errors at the municipality level (160 clusters). IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A11: Effects of Homicide Rates on Budget Shares: Municipality Economic Controls

		(1)	(2)	(3)	(4)
		All households		Nuclear with children	
Food	ln(total expenditure)	-19.38***	-17.11***	-26.67***	-23.80***
		(4.23)	(4.19)	(7.45)	(6.93)
	$\sqrt[4]{}$ Homicide rate last 12 months	-0.96	-1.22*	-1.26	-1.90**
		(0.65)	(0.73)	(1.03)	(0.92)
Drinks and Tobacco	ln(total expenditure)	1.75	1.34	3.12	2.60
		(1.14)	(1.09)	(2.03)	(1.66)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.20	0.23	0.18	0.14
		(0.16)	(0.22)	(0.19)	(0.22)
Male clothing	ln(total expenditure)	1.00	1.04*	0.90	0.96
		(0.62)	(0.62)	(0.82)	(0.72)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.21*	0.25*	0.29*	0.29*
		(0.12)	(0.14)	(0.15)	(0.16)
Female clothing	ln(total expenditure)	0.82	0.66	0.84	0.68
		(0.69)	(0.72)	(0.98)	(0.90)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.06	0.11	0.10	0.19
		(0.10)	(0.11)	(0.14)	(0.16)
Children goods	ln(total expenditure)	-0.30	-0.55	-0.27	-1.02
		(1.00)	(0.96)	(1.45)	(1.42)
	$\sqrt[4]{}$ Homicide rate last 12 months	-0.24	-0.18	-0.27	-0.24
		(0.17)	(0.18)	(0.24)	(0.25)
Hygiene and care	ln(total expenditure)	-2.02	-1.51	-1.18	-0.56
		(1.68)	(1.65)	(2.40)	(2.30)
	$\sqrt[4]{}$ Homicide rate last 12 months	-0.70***	-0.43*	-0.54*	-0.39
		(0.25)	(0.23)	(0.31)	(0.28)
Other hh goods	ln(total expenditure)	2.15	1.31	6.17	4.99
		(2.79)	(2.94)	(4.33)	(4.16)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.07	0.09	0.61	0.43
		(0.44)	(0.50)	(0.50)	(0.48)
Transportation	ln(total expenditure)	10.16***	9.06***	8.81*	7.72*
		(2.80)	(2.76)	(5.03)	(4.48)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.51	0.76	-0.10	0.65
		(0.48)	(0.49)	(0.53)	(0.63)
Health	ln(total expenditure)	0.54	0.40	2.91*	2.56
		(1.33)	(1.28)	(1.67)	(1.57)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.26	0.38	0.26	0.32
		(0.27)	(0.27)	(0.36)	(0.33)
Education	ln(total expenditure)	-0.06	-0.36	-0.30	-0.57
		(0.83)	(0.84)	(1.21)	(1.32)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.19	0.15	0.14	0.10
		(0.14)	(0.15)	(0.21)	(0.22)
Recreation	ln(total expenditure)	5.17***	4.97***	5.50*	4.87*
		(1.47)	(1.51)	(2.98)	(2.69)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.36	0.05	0.56	0.50
		(0.27)	(0.25)	(0.36)	(0.32)
Gambling	ln(total expenditure)	0.16	0.20	0.15	0.24
		(0.17)	(0.15)	(0.28)	(0.22)
	$\sqrt[4]{}$ Homicide rate last 12 months	0.03	0.04	0.02	0.05
		(0.02)	(0.03)	(0.03)	(0.04)
	Municipality controls	✓	✓	✓	✓
	Household controls	✓	✓	✓	✓
	Month and year of interview FE	✓	✓	✓	✓
	Household FE	✓	✓	✓	✓
	Instrument expenditure	✓	✓	✓	✓
	Double Lasso		✓		✓
	Observations	8,502	8,502	5,626	5,626

Notes:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Estimates based on a system of linear equations clustering standard errors at the municipality level (160 clusters). IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy. Municipality controls include: share of manufacturing, commerce, and

Table A12: Impacts of Homicide Rates on Budget Shares: QUAIDS

	(1)	(2)	(3)	(4)	(5)	(6)
		All households			**Nuclear with children**	
	ln(exp)	ln(exp) ^{2}	$\sqrt[4]{\text{Hom. rate}}$	ln(exp)	ln(exp) ^{2}	$\sqrt[4]{\text{Hom. rate}}$
Food	3.23	-0.87*	-1.10**	3.55	-1.00*	-1.36**
	(10.65)	(0.47)	(0.47)	(13.58)	(0.60)	(0.59)
Drinks and Tobacco	2.02	-0.11	0.06	3.69	-0.16	0.01
	(2.47)	(0.11)	(0.14)	(2.76)	(0.12)	(0.13)
Male clothing	2.94*	-0.04	0.24***	1.15	0.01	0.25***
	(1.65)	(0.08)	(0.08)	(1.82)	(0.08)	(0.09)
Female clothing	-1.82	0.13*	0.06	-3.67*	0.20**	0.06
	(1.66)	(0.07)	(0.07)	(1.91)	(0.09)	(0.10)
Children goods	0.33	0.01	-0.07	0.54	0.02	-0.11
	(2.16)	(0.10)	(0.14)	(2.89)	(0.14)	(0.19)
Hygiene and care	6.04	-0.30*	-0.42**	8.38*	-0.39**	-0.36*
	(3.90)	(0.18)	(0.17)	(4.39)	(0.20)	(0.19)
Other hh goods	-0.17	0.09	0.20	1.60	0.10	0.56*
	(7.89)	(0.35)	(0.31)	(8.61)	(0.39)	(0.34)
Transportation	5.39	0.06	0.58*	4.93	0.02	0.35
	(6.56)	(0.30)	(0.30)	(8.49)	(0.38)	(0.38)
Health	-1.93	0.15	0.24	-1.48	0.18	0.21
	(3.48)	(0.16)	(0.15)	(3.52)	(0.17)	(0.21)
Education	-2.27	0.11	0.07	-5.46	0.26*	0.07
	(2.47)	(0.11)	(0.08)	(3.46)	(0.16)	(0.13)
Recreation	-11.85***	0.69***	0.13	-10.75**	0.65***	0.31
	(3.80)	(0.17)	(0.19)	(5.22)	(0.23)	(0.23)
Gambling	-1.91	0.09	0.02	-2.49	0.12	0.02
	(1.43)	(0.06)	(0.01)	(2.10)	(0.09)	(0.02)
F (instruments)	62.69			33.80		
Joint test $ln(x)^2$: χ^2	34.48			26.32		
Joint test $ln(x)^2$: p-value	0.00			0.01		
Household controls	✓			✓		
Month and year of interview FE	✓			✓		
Household FE	✓			✓		
Instrument expenditure	✓			✓		
Observations	8,502			5,626		

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A13: Impacts of Homicide Rates on Budget Shares: QUAIDS Control for Unobserved Prices

	(1)	(2)	(3)	(4)	(5)	(6)
		All households			**Nuclear with children**	
	ln(exp)	ln(exp) ^{2}	$\sqrt[4]{\text{Hom. rate}}$	ln(exp)	ln(exp) ^{2}	$\sqrt[4]{\text{Hom. rate}}$
Food	-1.11	-0.76	-0.95*	-2.59	-0.84	-1.63**
	(17.66)	(0.77)	(0.52)	(23.07)	(0.99)	(0.75)
Drinks and Tobacco	6.31	-0.30*	-0.11	8.32**	-0.36**	-0.09
	(4.03)	(0.18)	(0.16)	(4.07)	(0.17)	(0.15)
Male clothing	2.98	-0.02	0.26***	0.87	0.03	0.29***
	(2.74)	(0.13)	(0.09)	(3.54)	(0.16)	(0.11)
Female clothing	-3.18	0.20	0.07	-3.48	0.17	0.11
	(2.82)	(0.13)	(0.10)	(3.75)	(0.17)	(0.13)
Children goods	1.80	-0.06	0.06	0.55	0.05	0.07
	(2.93)	(0.14)	(0.16)	(4.09)	(0.18)	(0.23)
Hygiene and care	8.75	-0.43*	-0.34*	14.28**	-0.69**	-0.21
	(5.37)	(0.25)	(0.20)	(6.68)	(0.31)	(0.24)
Other hh goods	-10.96	0.53	-0.22	-8.84	0.58	0.26
	(11.78)	(0.53)	(0.40)	(13.00)	(0.57)	(0.47)
Transportation	5.06	0.13	0.81**	1.39	0.26	0.53
	(11.09)	(0.51)	(0.34)	(13.63)	(0.63)	(0.47)
Health	7.06	-0.30	0.27	6.86	-0.21	0.23
	(6.62)	(0.29)	(0.23)	(6.99)	(0.33)	(0.27)
Education	1.25	-0.03	0.12	-2.15	0.13	0.14
	(3.77)	(0.16)	(0.12)	(4.62)	(0.21)	(0.16)
Recreation	-17.28***	1.00***	0.03	-14.38*	0.84**	0.28
	(5.69)	(0.26)	(0.21)	(7.76)	(0.33)	(0.28)
Gambling	-0.68	0.04	0.02	-0.82	0.04	0.01
	(0.70)	(0.03)	(0.02)	(1.17)	(0.05)	(0.03)
F (instruments)	38.30			22.34		
Joint test $ln(x)^2$: χ^2	30.79			18.46		
Joint test $ln(x)^2$: p-value	0.00			0.07		
Household controls	✓			✓		
Month and year of interview FE	✓			✓		
Household FE	✓			✓		
Instrument expenditure	✓			✓		
Observations	8,502			5,626		

Notes:* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A14: Familywise Error Rate p-values

	(1)	(2)	(3)	(4)
	All households		**Nuclear with children**	
	$\sqrt[4]{}$ Homicide rate last 12 months	FWER p-value	$\sqrt[4]{}$ Homicide rate last 12 months	FWER p-value
Food	-1.15**	0.02	-1.43***	0.01
Drinks and Tob.	0.06	0.69	0.01	0.92
Female clothing	0.07	0.30	0.06	0.48
Male clothing	0.23***	0.00	0.24***	0.01
Children goods	-0.06	0.67	-0.10	0.60
Education	0.08	0.31	0.08	0.55
Health	0.24	0.13	0.21	0.31
Transportation	0.61**	0.05	0.38	0.31
Hygiene and care	-0.45***	0.01	-0.38*	0.05
Other hh goods	0.20	0.48	0.58*	0.05
Recreation	0.15	0.42	0.32	0.17
Gambling	0.02*	0.06	0.02	0.10

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. p-values are calculated controlling for the familywise error rate (FWER), this is the probability of making any type I error across the 12 equations. The procedure allows for p-values to be correlated across specifications using a bootstrapping approach (3,000 replications) and clustering errors at the municipality level. Calculations use the *mhtreg* Stata package developed by Andreas Steinmayr, LMU Munich.

Table A15: Mundlak Effects: Effects of Homicide Rates on Budget Shares

		(1) All households	(2) Nuclear with children
Food	ln(total expenditure)	-17.61***	-16.89***
		(1.46)	(1.75)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	-0.87*	-1.22**
		(0.52)	(0.60)
	p-value Mundlak effects	0.06	0.42
Drinks and Tobacco	ln(total expenditure)	-0.18	-0.17
		(0.37)	(0.44)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.02	-0.03
		(0.14)	(0.13)
	p-value Mundlak effects	0.00	0.30
Male clothing	ln(total expenditure)	0.86***	0.92***
		(0.21)	(0.26)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.20***	0.23***
		(0.07)	(0.09)
	p-value Mundlak effects	0.13	0.26
Female clothing	ln(total expenditure)	0.64***	0.80***
		(0.23)	(0.30)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.04	0.05
		(0.07)	(0.10)
	p-value Mundlak effects	0.11	0.01
Children goods	ln(total expenditure)	0.20	0.35
		(0.26)	(0.35)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	-0.07	-0.11
		(0.15)	(0.19)
	p-value Mundlak effects	0.00	0.00
Hygiene and care	ln(total expenditure)	-1.32***	-1.39***
		(0.42)	(0.50)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	-0.44***	-0.37*
		(0.17)	(0.20)
	p-value Mundlak effects	0.15	0.13
Other hh goods	ln(total expenditure)	2.63**	2.78**
		(1.03)	(1.13)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.18	0.51
		(0.32)	(0.33)
	p-value Mundlak effects	0.34	0.08
Transportation	ln(total expenditure)	10.24***	9.90***
		(1.07)	(1.32)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.55*	0.36
		(0.32)	(0.39)
	p-value Mundlak effects	0.37	0.01
Health	ln(total expenditure)	2.27***	1.95***
		(0.42)	(0.46)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.20	0.15
		(0.17)	(0.22)
	p-value Mundlak effects	0.02	0.19
Education	ln(total expenditure)	-0.01	-0.14
		(0.28)	(0.40)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.06	0.07
		(0.10)	(0.14)
	p-value Mundlak effects	0.00	0.00
Recreation	ln(total expenditure)	2.25***	1.87***
		(0.39)	(0.52)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.11	0.34
		(0.17)	(0.22)
	p-value Mundlak effects	0.00	0.00
Gambling	ln(total expenditure)	0.02	0.02
		(0.04)	(0.05)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.02*	0.02
		(0.01)	(0.02)
	p-value Mundlak effects	0.74	0.76
	Household controls	✓	✓
	Month and year of interview FE	✓	✓
	Mundlak effects	✓	✓
	Instrument expenditure	✓	✓
	Observations	8,502	5,626

Table A16: Effects of Homicide Rates on Budget Shares: Purchased versus Home production/gifts

		(1)	(2)	(3)	(4)
		All households		Nuclear with children	
		Purchased	HP/Gifts	Purchased	HP/Gifts
Food	ln(total expenditure)	-12.52***	2.35	-17.84***	2.72
		(3.95)	(1.51)	(5.55)	(1.94)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	-0.91	0.09	-1.01	-0.13
		(0.55)	(0.24)	(0.65)	(0.14)
Drinks and Tobacco	ln(total expenditure)	-0.27	0.12	0.55	0.06
		(0.89)	(0.16)	(1.33)	(0.10)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.06	-0.00	0.03	-0.01
		(0.14)	(0.01)	(0.13)	(0.01)
Male clothing	ln(total expenditure)	1.65***	0.28	1.27**	-0.05
		(0.56)	(0.18)	(0.62)	(0.06)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.21***	0.02	0.24***	0.00
		(0.07)	(0.02)	(0.09)	(0.01)
Female clothing	ln(total expenditure)	1.18*	0.15	0.95	-0.09
		(0.69)	(0.24)	(1.06)	(0.09)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.05	0.01	0.07	-0.01
		(0.07)	(0.02)	(0.09)	(0.01)
Children goods	ln(total expenditure)	1.31*	-0.13	2.15*	-0.11
		(0.72)	(0.15)	(1.23)	(0.23)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	-0.01	-0.05**	-0.04	-0.06*
		(0.13)	(0.02)	(0.17)	(0.04)
Hygiene and care	ln(total expenditure)	-1.57		-0.97	
		(1.27)		(1.77)	
	$\sqrt[4]{\ }$ Homicide rate last 12 months	-0.45**		-0.38*	
		(0.17)		(0.20)	
Other hh goods	ln(total expenditure)	1.24		4.85	
		(2.45)		(3.34)	
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.20		0.58*	
		(0.31)		(0.35)	
Transportation	ln(total expenditure)	8.27***	0.40	7.83**	0.19
		(2.28)	(1.20)	(3.72)	(1.83)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.60**	0.25	0.38	0.09
		(0.29)	(0.17)	(0.37)	(0.25)
Health	ln(total expenditure)	0.83	-0.02	2.14*	-0.09
		(0.94)	(0.10)	(1.17)	(0.17)
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.23	0.01	0.21	-0.00
		(0.16)	(0.01)	(0.21)	(0.01)
Education	ln(total expenditure)	0.48		0.34	
		(0.70)		(1.22)	
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.08		0.08	
		(0.09)		(0.13)	
Recreation	ln(total expenditure)	2.80**		2.22	
		(1.26)		(2.07)	
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.10		0.23	
		(0.15)		(0.19)	
Gambling	ln(total expenditure)	0.12		0.10	
		(0.10)		(0.20)	
	$\sqrt[4]{\ }$ Homicide rate last 12 months	0.02*		0.02	
		(0.01)		(0.02)	
	Household controls	✓	✓	✓	✓
	Month and year of interview FE	✓	✓	✓	✓
	Household FE	✓	✓	✓	✓
	Instrument expenditure	✓	✓	✓	✓
	Observations	8,502	8,502	5,626	5,626

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Estimates based on a system of linear equations clustering standard errors at the municipality level (160 clusters). IV estimates are based on a control function approach bootstrapping standard errors (500 replications) clustered at the municipality level. The dependent variables are budget shares of household goods, defined as the expenditure on that good divided by total household expenditure. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A17: Effect of Homicide Rates on Wealth, Earnings, and Informal Jobs

	ln(Wealth)	$\sqrt[4]{}$ Total earnings last year	Number oral contracts	Someone oral contract
	(1)	(2)	(3)	(4)
$\sqrt[4]{}$ Homicide rate last 12 months	-0.112	0.059	0.032	0.023
	(0.123)	(0.298)	(0.029)	(0.020)
Household controls	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Observations	8,502	8,502	8,502	8,502
adj. R^2	0.21	0.32	0.25	0.21

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level. Household controls include: wife's and husband's age, wife's and husband's age squared, wife's and husband's secondary school dummy, number of household members by gender and age group, logarithm of total household size, and rural locality dummy.

Table A18: Effects of Homicide Rates on Market Prices

	Food	HH goods	Men clothes	Women clothes	Child clothes
$\sqrt[4]{}$ Hom. last 12 months	-0.03*	-0.07	-0.05	-0.07	-0.01
	(0.02)	(0.05)	(0.03)	(0.04)	(0.04)
Intercept	0.43***	0.12***	0.15***	0.13***	0.12***
	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)
State-Survey FE					
Observations	120	120	120	120	120
$\sqrt[4]{}$ Hom. last 12 months	-0.01	-0.03	-0.03	-0.07	0.05
	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)
Intercept	0.45***	0.06	0.07	-0.03	0.11
	(0.03)	(0.10)	(0.10)	(0.06)	(0.10)
State-Survey FE	✓	✓	✓	✓	✓
Observations	120	120	120	120	120

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variables are price indices calculated as median municipality prices based on MxFLS community market prices.

Table A19: Effect of homicides on fear of victimization

	Wife				**Husband**			
	Scared attacked day	Scared attacked night	Feels safer	Expect attack	Scared attacked day	Scared attacked night	Feels safer	Expect attack
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\sqrt[4]{}$ Homicide rate last 12 months	0.054	0.083**	-0.075***	0.115**	0.049	0.028	-0.044*	0.059
	(0.035)	(0.039)	(0.027)	(0.053)	(0.036)	(0.035)	(0.025)	(0.047)
Intercept	2.459***	1.694***	1.161***	2.111***	1.934***	2.013***	0.976***	2.545***
	(0.558)	(0.591)	(0.402)	(0.711)	(0.477)	(0.469)	(0.363)	(0.713)
Household controls	✓	✓	✓	✓	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓	✓	✓	✓	✓
Household FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	6,134	6,134	6,134	4,820	5,984	5,984	5,984	4,876
adj. R^2	0.17	0.16	0.10	0.18	0.16	0.20	0.09	0.18

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level.

Table A20: Effect of homicides on household composition

	Number Female					Number Male						
	0-6	7-11	12-18	18-55	+55	0-6	7-11	12-18	18-55	+55	HHsize	Log(hhsize)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\sqrt[4]{}$ Homicide rate last 12 months	-0.006	0.020	-0.021	-0.013	0.003	0.009	-0.028*	0.009	0.003	-0.005	-0.014	-0.003
	(0.011)	(0.016)	(0.015)	(0.014)	(0.007)	(0.011)	(0.015)	(0.014)	(0.014)	(0.006)	(0.023)	(0.004)
Intercept	-1.401***	1.023***	1.650***	3.583***	-0.849***	-1.199***	0.854***	2.028***	2.638***	-0.613***	7.711***	2.171***
	(0.148)	(0.171)	(0.184)	(0.169)	(0.085)	(0.144)	(0.147)	(0.163)	(0.170)	(0.073)	(0.306)	(0.067)
Household controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Household FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	8,502	8,502	8,502	8,502	8,502	8,502	8,502	8,502	8,502	8,502	8,502	8,502
adj. R^2	0.54	0.22	0.43	0.65	0.79	0.55	0.23	0.45	0.64	0.80	0.86	0.88

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level. Columns (1-5) outcome variable is the number of female members in the correspondent age group living in the household. Columns (6-10) outcome variable is the number of male members in the correspondent age group living in the household. Columns 11 and 12 outcome variable are the number and logarithm of household size, respectively.

Table A21: Effect of homicides on Male Labor Supply

	Husband worked last week			Husband $\sqrt[4]{}$ Hours worked last 12 months			Men $\sqrt[4]{}$ Hours worked last 12 months
		Self-employed	Wage workers		Self-employed	Wage workers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\sqrt[4]{}$ Homicide rate last 12 months	-0.017	-0.012	-0.008	-0.025	-0.001	0.054	-0.021
	(0.012)	(0.017)	(0.011)	(0.084)	(0.142)	(0.065)	(0.098)
Intercept	1.748***	4.090***	2.503***	14.679***	30.518***	17.543***	9.171***
	(0.232)	(0.402)	(0.254)	(1.542)	(3.104)	(1.735)	(1.583)
Household controls	✓	✓	✓	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓	✓	✓	✓
Household FE	✓	✓	✓	✓	✓	✓	✓
anio_int	✓	✓	✓	✓	✓	✓	✓
Observations	6,504	1,842	3,534	6,032	1,704	3,280	4,900
adj. R^2	0.41	0.17	0.11	0.46	0.21	0.17	0.46

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level. Columns (1-3) outcome variable is an indicator variable equal to 1 if the husband worked last week. Columns (4-6) outcome variable is the quartic root of the number hours worked by the husband in the last 12 months Column 7 outcome variable is the quartic root of the number hours worked by all male members of the houshold in the last 12 months.

Table A22: Effect of Homicide Rates on Decision Making-Spousal Disagreements

	(1) Wife takes power	(2) Wife given power	(3) Husband takes power	(4) Husband given power
Food eaten in the house	0.001	0.013*	0.007	0.010
	(0.010)	(0.008)	(0.015)	(0.010)
Wife's clothes	-0.012	0.017**	-0.019	0.018*
	(0.011)	(0.008)	(0.012)	(0.010)
Husband's spouses' clothes	-0.010	-0.002	-0.013	-0.013
	(0.011)	(0.012)	(0.010)	(0.013)
Large expenditures for the house	0.012	0.012	-0.001	-0.004
	(0.021)	(0.014)	(0.010)	(0.008)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All regressions have 2,789 observations. Each number is the coefficient of the quartic root of the homicide rate of a different regression whose outcome variable is described by the column with respect to the decision described in the row. Column (1) outcome variable is equal to 1 if the wife reports been the decision maker solely or jointly with her husband, and her husband disagrees. Column (2) outcome variable is equal to 1 if the wife reports not been the decision maker but her husband disagrees. Column (3) outcome variable is equal to 1 if the husband reports been the decision maker solely or jointly with his wife, and his wife disagrees. Column (4) outcome variable is equal to 1 if the husbamd reports not been the decision maker but his wife disagrees.

A.2 Appendix Figures

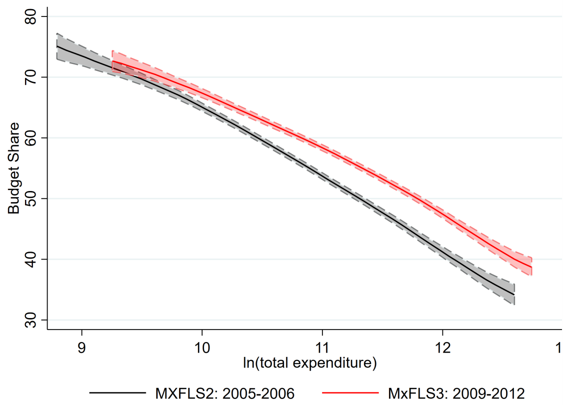
Figure A1: Heterogeneous Effects of Homicide Rates on Total Household Expenditure

(a) All households (b) Nuclear households

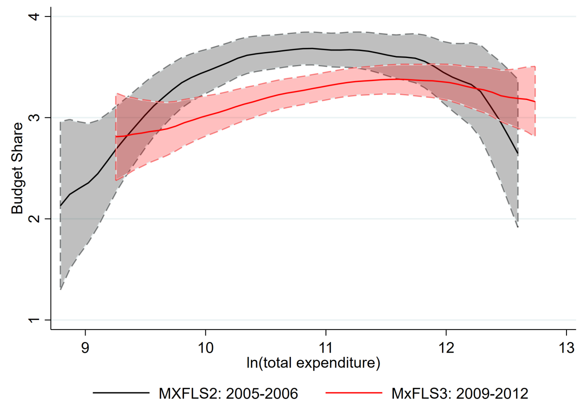
Notes: Figure A1 plots marginal effects of increases in homicides on the log of total household expenditure. Each coefficient is estimated in a separate regression in which the sample is restricted to the categories reported in the left columns. Standard errors are clustered at the municipality level. Confidence intervals are constructed with a 90% significance level.

Figure A2: Non-Parametric Engel Curves

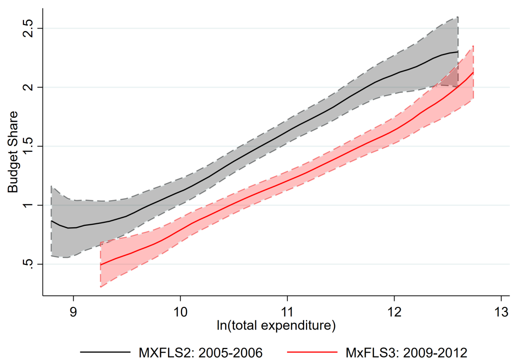
(a) Food



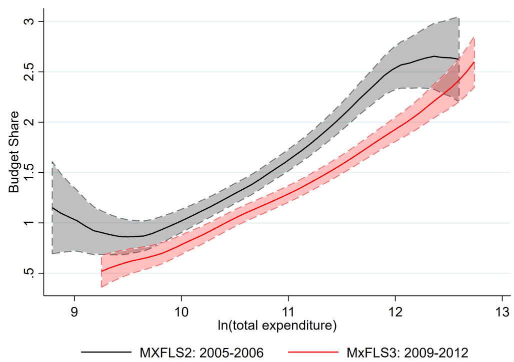
(b) Drinks and Tobacco



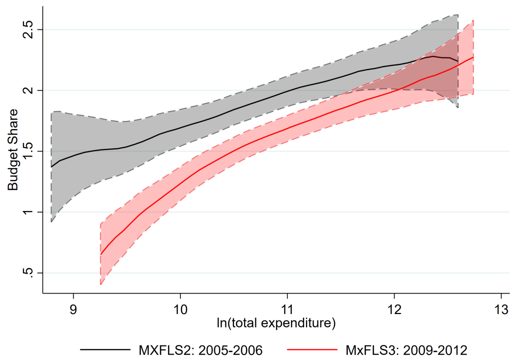
(c) Male Clothing



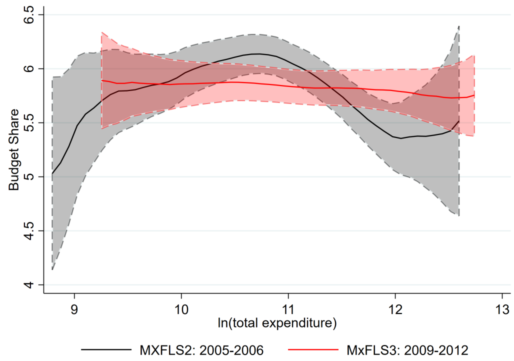
(d) Female Clothing



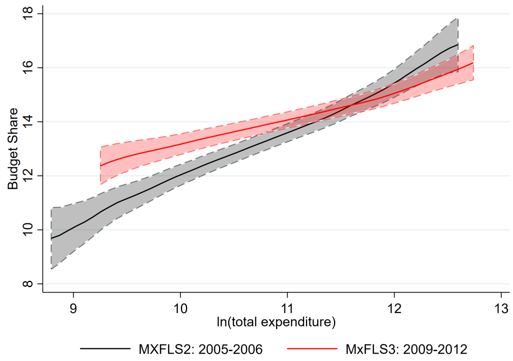
(e) Children goods



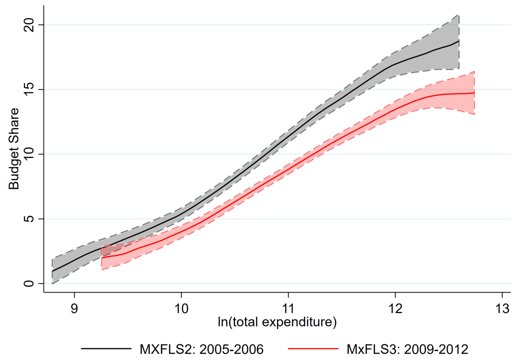
(f) Hygiene and Personal Care



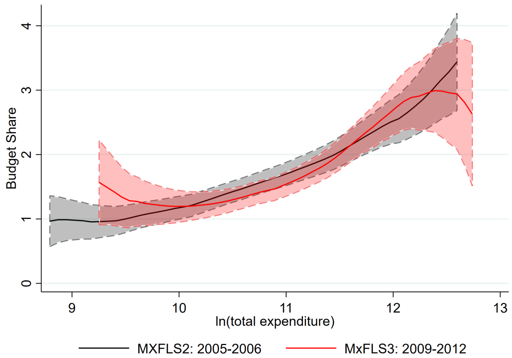
(g) Other Household Public goods



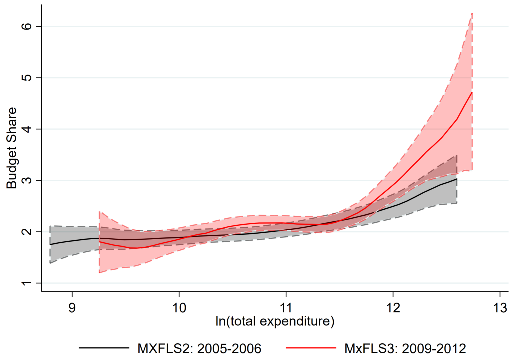
(h) Transportation



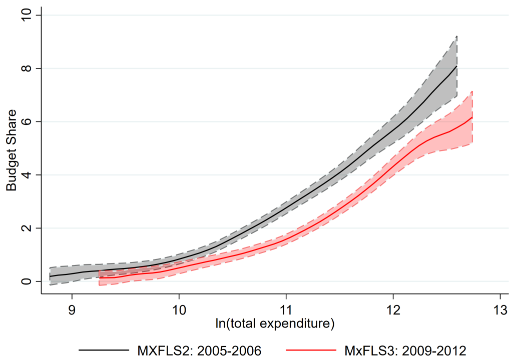
(i) Health



(j) Education



(k) Recreation



(l) Gambling

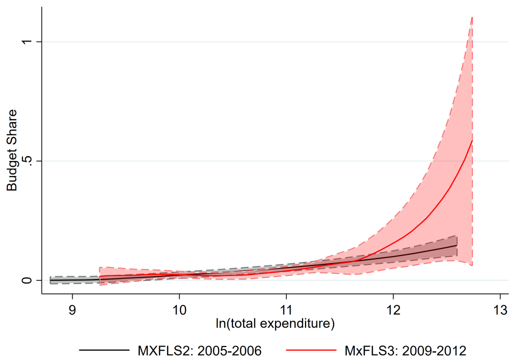
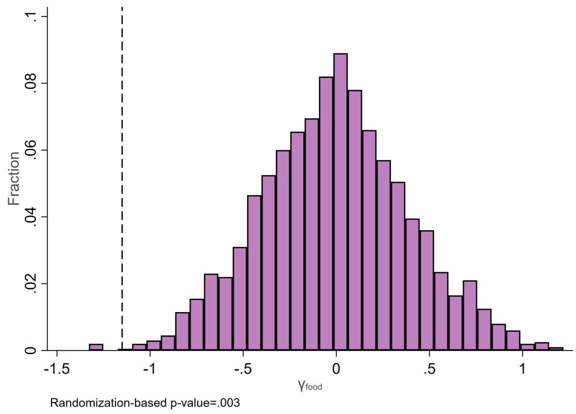
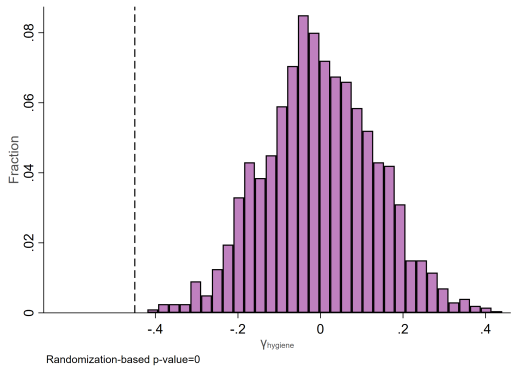


Figure A4: Randomization Inference of Homicide Rate's Effects on Budget Shares

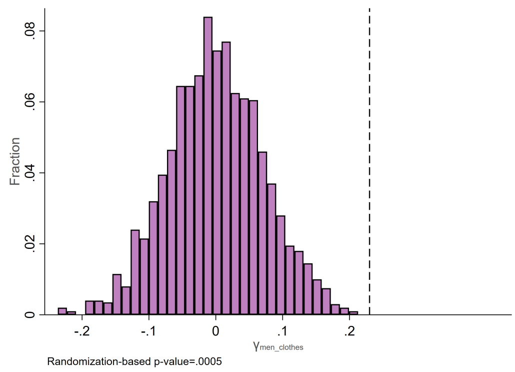
(a) Food



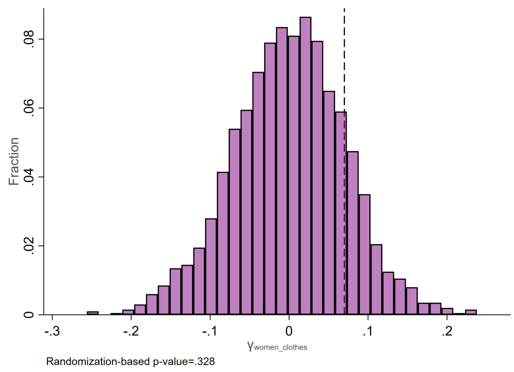
(b) Hygiene and Personal Care



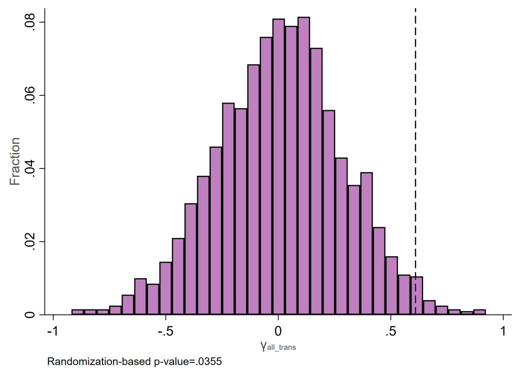
(c) Male Clothing



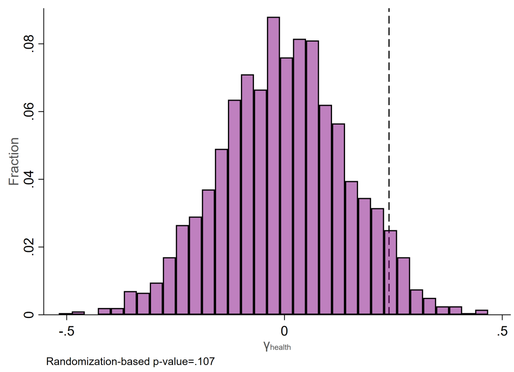
(d) Female Clothing



(e) Transportation

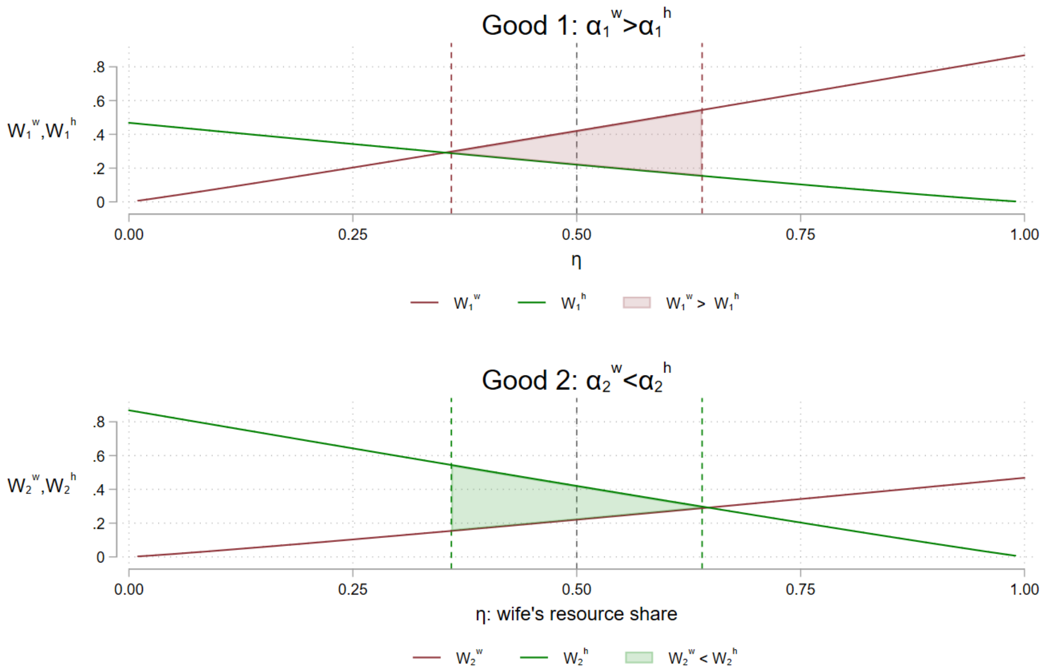


(f) Health



Notes: These figures show the distribution of the homicides coefficients obtained from column (1) specification of Table 5 while randomly replacing the change in the quartic root of the municipality's homicide rate. The random reassignments come from the original distribution of homicide rates of the analytical sample. The black dashed line represents actual estimates from the main specification.

Figure A5: Budget Shares vs. Resource Shares



A.3 Attrition Analysis

Table A23 presents an analysis of the probability of attrition based on the following probit regression specification:

$$A_{ij} = \Phi(\alpha + \beta H_j + \gamma X_{ij} + \pi_s + \epsilon_{ij}) \tag{A1}$$

where A_{ij} is an indicator variable equal to 1 if household i living in municipality j in 2005–2006 was not interviewed or had relevant missing information in 2009–2012 MxFLS-3. The regressor of interest H_j is the difference between the quartic root of the homicide rate in 2009 and 2005 in municipality j. The vector of household characteristics X_{ij} includes: wife's age, husband's age, wife's secondary education dummy, husband's secondary education dummy, number of kids, average age of children, rural dummy, log(household size), and year and month of interview fixed effects. π_s are state fixed effects. Finally, errors are clustered at the municipality level. Following Velasquez (2019), I also run an specification interacting the measure of violence with X_{ij}. These interactions aim to capture whether there are heterogeneities in selective attrition based on households' baseline attributes. The results are qualitatively equivalent using a linear probability model and are available upon request.

Table A23: Prediction of Attrition

	All households			Nuclear with children		
$\Delta\sqrt[4]{H\_j}$	-0.020	-0.013	0.063	0.004	-0.006	-0.096
	(0.023)	(0.047)	(0.199)	(0.030)	(0.047)	(0.215)
$\Delta\sqrt[4]{H\_j}$ *age wife			0.003			0.002
			(0.006)			(0.009)
$\Delta\sqrt[4]{H\_j}$ *age husb			-0.000			0.000
			(0.005)			(0.006)
$\Delta\sqrt[4]{H\_j}$ *secondary wife			-0.077			-0.070
			(0.063)			(0.067)
$\Delta\sqrt[4]{H\_j}$ *secondary husb			0.097			0.077
			(0.064)			(0.069)
$\Delta\sqrt[4]{H\_j}$ *# kids			0.004			-0.023
			(0.028)			(0.019)
$\Delta\sqrt[4]{H\_j}$ *children average age			0.005			0.005
			(0.005)			(0.007)
$\Delta\sqrt[4]{H\_j}$ *rural			-0.017			-0.029
			(0.056)			(0.063)
$\Delta\sqrt[4]{H\_j}$ *log (hhsize)			-0.162			
			(0.109)			
Intercept	-0.680***	-1.148***	-1.180***	-0.770***	-1.112***	-1.065***
	(0.029)	(0.294)	(0.298)	(0.034)	(0.313)	(0.315)
Household controls		✓	✓		✓	✓
State FE		✓	✓		✓	✓
N	5,637	4,838	4,838	3,731	3,726	3,726
Mean dependent variable	0.25	0.23	0.23	0.22	0.22	0.22
adj. R^2						
χ^2 interactions jointly=0 (p-value)			0.13			0.18

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level The outcome variable is an indicator variable equal to 1 if qualifying household in MxFLS-2 was not interviewed in MxFLS-3. Household controls include: wife's age, husband's age, wife's secondary education dummy, husband's secondary education dummy, number of kids, average age of children, rural dummy, log(household size), and year and month of interview fixed effects.

A.4 Selective Migration

Table A24 presents an analysis of the probability of migration based on the following probit regression specification:

$$M_{ij} = \Phi(\alpha + \beta H_j + \gamma X_{ij} + \pi_s + \epsilon_{ij}) \quad \text{(A2)}$$

where M_{ij} is an indicator variable equal to 1 if household i living in municipality j in 2005-2006 resided in a different municipality in 2009–2012 MxFLS-3. The regressor of interest H_j is the difference between the quartic root of the homicide rate in 2009 and 2005 in municipality j. The vector of household characteristics X_{ij} includes: wife's age, husband's age, wife's secondary education dummy, husband's secondary education dummy, number of kids, average age of children, rural dummy, log(household size), and year and month of interview fixed effects. γ_s are state fixed effects. Finally, errors are clustered at the municipality level. Following Brown and Velasquez 2017 and Velasquez 2019, I also run an specification interacting the measure of violence with X_{ij}. These interactions aim to capture whether there are heterogeneities in selective migration based on households baseline attributes. The results are qualitatively equivalent using a linear probability model and are available upon request.

Table A24: Prediction of Migration

	All households			Nuclear with children		
$\Delta\sqrt[4]{H\text{-}j}$	-0.039	0.067	-0.235	-0.039	0.084	-0.345
	(0.095)	(0.087)	(0.351)	(0.100)	(0.091)	(0.304)
$\Delta\sqrt[4]{H\text{-}j}$ *age wife			0.007			0.001
			(0.015)			(0.017)
$\Delta\sqrt[4]{H\text{-}j}$ *age husb			-0.009			-0.005
			(0.012)			(0.014)
$\Delta\sqrt[4]{H\text{-}j}$ *secondary wife			0.021			0.023
			(0.123)			(0.132)
$\Delta\sqrt[4]{H\text{-}j}$ *secondary husb			0.290**			0.309**
			(0.130)			(0.137)
$\Delta\sqrt[4]{H\text{-}j}$ *# kids			0.016			-0.005
			(0.044)			(0.042)
$\Delta\sqrt[4]{H\text{-}j}$ *children average age			0.009			0.023
			(0.013)			(0.016)
$\Delta\sqrt[4]{H\text{-}j}$ *rural			0.252			0.363**
			(0.186)			(0.172)
$\Delta\sqrt[4]{H\text{-}j}$ *log (hhsize)			-0.022			
			(0.192)			
Intercept	-1.836***	-1.651***	-1.631***	-1.776***	-0.458	-0.207
	(0.122)	(0.597)	(0.611)	(0.121)	(0.518)	(0.550)
Household controls		✓	✓		✓	✓
State FE		✓	✓		✓	✓
N	4,251	3,518	3,518	2,813	2,515	2,515
Mean dependent variable	0.03	0.03	0.03	0.04	0.04	0.04
adj. R^2						
χ^2 interactions jointly=0 (p-value)			0.58			0.11

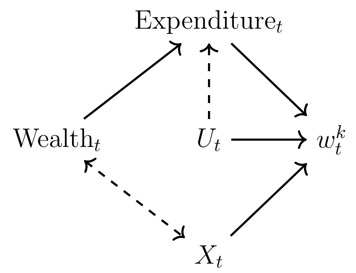
Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at the municipality level The outcome variable is an indicator variable equal to 1 the household change municipality of residence between MxFLS-2 and MxFLS-3. Household controls include: wife's age, husband's age, wife's secondary education dummy, husband's secondary education dummy, number of kids, average age of children, rural dummy, log(household size), and year and month of interview fixed effects.

A.5 Wealth Instrument of Total Expenditure

Figure A6 plots a directed acyclic graph showing the identification strategy of using wealth as an instrument for household's total expenditure. The need for an instrument is captured by the potential presence of U_t, unobservable heterogeneity correlated with household expenditure and w_t^k (consumption allocation of good k

in time t). Three assumptions must hold for wealth to be a valid instrument. First, it needs to affect total expenditure (first stage). Second, it needs to be exogenous (uncorrelated with U_t), at least after conditioning on a set of household controls X_t. Third, the only path from wealth to the consumption allocations must be the indirect path through Expenditure_t (exclusion restriction).

Figure A6: DAG: Wealth Instrument



The MxFLS records households' assets by first asking: "do/are you or any household member own [...]/owner of [...]?". If yes, it records a monetary value by asking "what is the value of the [...]?"or "in case you had to sell, how much approximately would you ask for the [...]?" or "in case you had to buy an equivalent [...], approximately how much would it cost?".

The instrument is built by taking the natural logarithm of the monetary value of all the following household assets: dwelling occupied by this household (including the land), other dwelling/building/real state/land/plot/agricultural/cattle or forest land, bicycles, motorcycles/trucks/cars/any other motorized vehicle, electronic devices (radio, TV, VCR, DVD player, computer, etc.), washer and dryer machine, stove, refrigerator, furniture, appliance (iron, blender, microwave, toaster, etc.), savings, financial assets, stocks, checking accounts, AFORES, coins and others, tractor/other machinery or equipment, livestock (cows, bulls, horses, pigs, chickens, etc.), other assets.

Table A25: First Stage Regression for Total Expenditure

	ln(total expenditure)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Wealth instrument)	0.074***	0.054***	0.026***	-0.105***	-0.085***	-0.025**
	(0.004)	(0.003)	(0.004)	(0.012)	(0.009)	(0.010)
ln(Wealth instrument)^2				0.012***	0.009***	0.004***
				(0.001)	(0.001)	(0.001)
age wife		0.002			-0.003	
		(0.005)			(0.005)	
age husb		0.016***			0.012**	
		(0.006)			(0.006)	
age wife^2		0.000	-0.000		0.000	-0.000
		(0.000)	(0.000)		(0.000)	(0.000)
age husb^2		-0.000***	-0.000		-0.000**	-0.000
		(0.000)	(0.000)		(0.000)	(0.000)
secondary wife		0.258***			0.226***	
		(0.019)			(0.018)	
secondary_husb		0.225***			0.199***	
		(0.021)			(0.020)	
log(household size)		0.384***	0.377***		0.374***	0.369***
		(0.079)	(0.133)		(0.079)	(0.133)
rural locality		-0.228***			-0.208***	
		(0.031)			(0.030)	
# by gender and age group		✓	✓		✓	✓
Household FE			✓			✓
Year FE	✓	✓	✓	✓	✓	✓
Month FE	✓	✓	✓	✓	✓	✓
F instrument total expenditure	305.29	239.11	52.83	223.96	224.05	38.46
p-value instrument total expenditure	0.00	0.00	0.00	0.00	0.00	0.00
N	8,502	8,502	8,502	8,502	8,502	8,502
adj. R^2	0.14	0.31	0.56	0.20	0.34	0.56

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at municipality level.

Table A26: First Stage Regression for Total Expenditure: Nuclear Households with Children

	ln(total expenditure)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Wealth instrument)	0.079***	0.055***	0.025***	-0.105***	-0.074***	-0.020
	(0.005)	(0.004)	(0.005)	(0.014)	(0.012)	(0.013)
ln(Wealth instrument)^2				0.012***	0.009***	0.003***
				(0.001)	(0.001)	(0.001)
age wife		-0.002			-0.007	
		(0.009)			(0.009)	
age husb		0.025***			0.022***	
		(0.008)			(0.007)	
age wife^2		0.000	-0.000		0.000	0.000
		(0.000)	(0.000)		(0.000)	(0.000)
age husb^2		-0.000***	-0.000		-0.000***	-0.000
		(0.000)	(0.000)		(0.000)	(0.000)
secondary wife		0.268***			0.239***	
		(0.021)			(0.020)	
secondary_husb		0.215***			0.195***	
		(0.024)			(0.024)	
log(household size)		0.110	0.102		0.075	0.089
		(0.177)	(0.247)		(0.172)	(0.251)
rural locality		-0.226***			-0.208***	
		(0.031)			(0.030)	
# by gender and age group		✓	✓		✓	✓
Household FE			✓			✓
Year FE	✓	✓	✓	✓	✓	✓
Month FE	✓	✓	✓	✓	✓	✓
F instrument total expenditure	208.77	157.47	27.15	183.80	156.43	24.33
p-value instrument total expenditure	0.00	0.00	0.00	0.00	0.00	0.00
N	5,626	5,626	5,626	5,626	5,626	5,626
adj. R^2	0.16	0.32	0.56	0.22	0.34	0.56

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, in parentheses, are clustered at municipality level.