

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. 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). Global economic shocks, climate change, and rising income inequality can all trigger new surges in violence in the near future (Fajnzylber, Lederman, and Loayza 2002; Miguel and Satyanath 2011; Enamorado et al. 2016; Levy, Sidel, and Patz 2017).

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 supply, marital outcomes, fear of victimization, and mental health (La Mattina 2017; Velasquez 2019; Balmori de la Miyar 2020). 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 house-

holds' 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 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, and unobserved prices are controlled for 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.

¹Previous 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 (Bobonis 2009; Attanasio and Lechene 2014; Chiappori and Mazzocco 2017). 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 (Jensen and Thornton 2003; Field and Ambrus 2008).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 (Doss 2013; Baland and Ziparo 2017). Previous research has mostly focused on the effects of exogenous shocks that

²In 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 (Hoehn-Velasco and Penglase 2021).

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 data and empirical strategy. Section 5 discusses the results on household expenditures. In section 6, I provide evidence of the effects of crime on explore the effect of crime on intra-household bargaining power, and section 7 discusses potential channels. Finally, section 8 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

(Figure 1). 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 (GPI 2016). In 2019, the homicide rate reached a new record of 35 per 100,000 people. The amount of lives lost was so drastic that life expectancy stagnated for young men at the national level, and even decreased in some parts of the country (Aburto and Beltrán-Sánchez 2019).

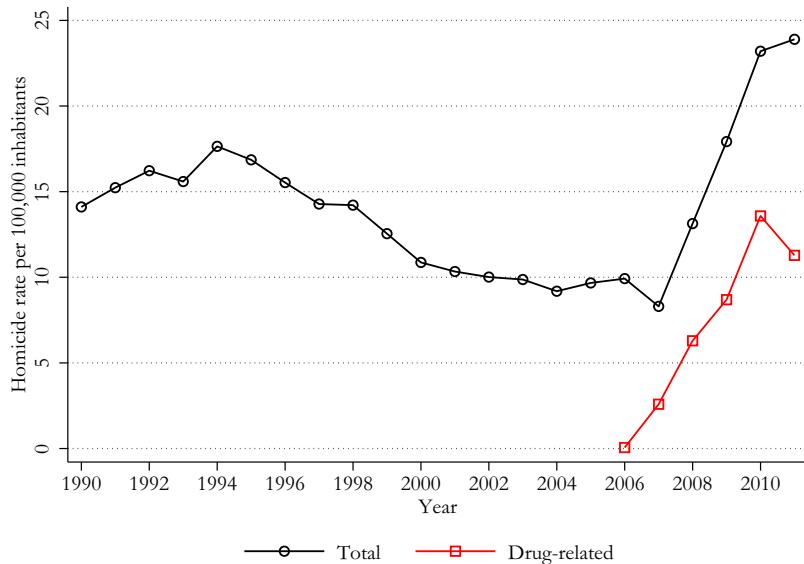
This rise in violence was driven by an increase in drug-related crime. Estimates suggest over 50,000 people were killed between 2007 and 2010 due to drug-related violence. Figure 1 plots the annual homicide rate and a “drug-related” homicide rate over time. The latter counts deaths directly attributable to members of the cartels killing each other or resulting from confrontation with armed forces that the Mexican government started counting in 2006.

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 (Calderon et al. 2015; Dell 2015; Osorio 2015; Lessing 2015; Lindo and Padilla-Romo 2018). 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.³ 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 (Castillo, Mejía, and Restrepo 2018), manufacturing job loss (Dell,

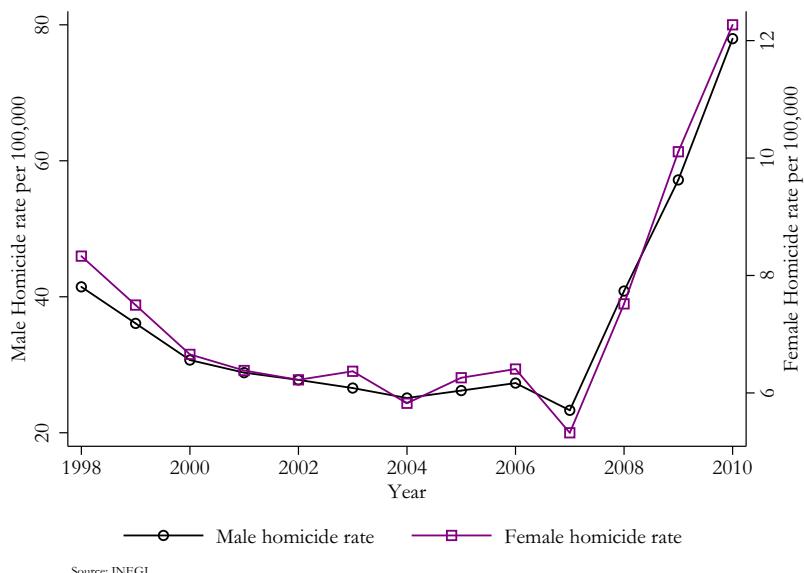
³Dell (2015) uses a regression discontinuity design to show how a subsequent, larger increase occurred in the homicide rate in the municipalities where Calderon’s political party won mayoral elections. Calderon et al. (2015) and Lindo and Padilla-Romo (2018) both show how the captures or killings of drug kingpins and lieutenants brought destabilizing effects through the cartels and were accompanied by escalations in homicides.

Figure 1: Annual Homicide Rate per 100,000 People

(a) Homicide Rate and Drug-Related Homicide Rate



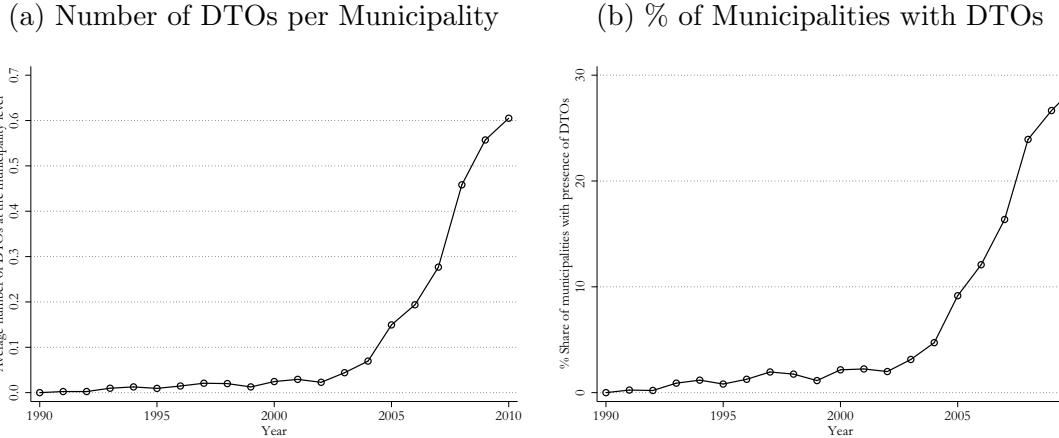
(b) 15-39 Male and Female Homicide Rate per 100,000 People



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



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.

Feigenberg, and Teshima 2019), agricultural price shocks (Dube, Garcia-Ponce, and Thom 2016), and income inequality (Enamorado et al. 2016).⁴

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 A1 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.⁵ By 2012, violence had spread to many new municipalities that had become attractive routes of drug trafficking (Calderon et al. 2015; Dell 2015).

The majority of the homicides have been perpetrated against adult men. But

⁴Castillo, Mejía, 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 coefficient increases drug-related homicides.

⁵The Sinaloa cartel has been commonly declared as the most powerful cartel in the world and is infamously known for its leader “El Chapo.”

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 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), and migration displacement effects (Basu and Pearlman 2017; Orozco-Aleman and Gonzalez-Lozano 2018).

Importantly, previous research has documented gendered effects of the Mexican drug war on fear of victimization, labor force participation, and mental health. 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. Balmori de la Miyar (2020) finds the increase in drug-related homicide rates had a negative effect on women's mental well-being, but had no statistical effects on men. 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 (Garcia 2011, Kim 2014).

3 Theoretical Framework

In this section, I present a general version of the collective model of intrahousehold allocation based on Browning, Chiappori, and Lewbel (2013) and Dunbar, Lewbel, and Pendakur (2013). I abstract from modeling marital formation decisions because

the empirical analysis is restricted to married households that were formed prior to the escalation in violence.

3.1 A Collective Model of the Household

Consider a static collective model of the household with two adult decision-makers, a wife w and a husband h .⁶ Households can consume K different goods with market prices $p = (p^1, \dots, p^K)'$. Let $z = (z^1, \dots, z^K)'$ be the K -vector of goods consumed by the household, and let y be the total expenditure incurred by the household. 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).⁷

The collective model of the household allows each individual to have their own utility function, and assumes there is Pareto efficiency within each period.⁸ Let $U_i(x_i)$ be the utility of individual i over the vector of consumption goods x_i . Individuals' total utility may also depend on other household members' utilities (caring

⁶For ease of exposition, I limit the discussion to nuclear households that consist of two adult decision makers and a number of dependents. The model can be easily extended to households with a greater number of male and female decision-makers in the household. The empirical analysis will account for the latter type of households as well.

⁷ 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, $z^k = \frac{1}{2}(x_w^k + x_h^k)$. Off diagonal elements of A may be different from zero if the degree to which a good can be shared depends on the consumption of other goods.

⁸The 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. Angelucci and Garlick (2016) study within-sample variation in the efficiency of intra-household resource allocation among low-income Mexican households and observe that consumption patterns are Pareto efficient for households with relatively old heads, but not in households with relative young heads. The average age of the household head in the empirical analysis of this paper is over 45 years old in the first round of the panel data used which alleviates the concerns posed by Angelucci and Garlick (2016)'s findings.

preferences), or depend on other economic decisions (e.g., leisure, savings). The individual's total utility function would then be assumed to be weakly separable over the subutility functions for the consumption goods $U_i(x_i)$ in a given period. I assume the $U_i(x_i)$ are monotonically increasing in consumption, twice continuously differentiable, and strictly quasi-concave.

At each period, households solve the following problem:

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

subject to a budget constraint:

$$z' p \leq y \quad (2)$$

and the consumption technology constraint:

$$z = A(x_w + x_h) \quad (3)$$

where $\mu(p, y)$ and $(1 - \mu(p, y))$ are the Pareto weights for the wife and the husband, respectively. Both preferences and Pareto weights are allowed to depend on individuals' socio-demographic characteristics (e.g., age, education, community characteristics) but will be suppressed to simplify notation in this section.

By the second welfare theorem, any Pareto efficient allocation can be supported as an equilibrium after transfers within household members. The solution to the maximization problem in (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 $\eta_i(p, y)y$. Following Dunbar, Lewbel, and Pendakur (2013), let η_w and η_h be defined as the resource share of the wife and the husband, respectively. The resource shares capture the fraction of household expenditure consumed by each household member and they must add up to one ($\eta_w + \eta_h = 1$).⁹ Under standard

⁹The allocation of shares of the household resources among the different household members is also known as the sharing rule in the collective model literature (Chiappori 1992; Vermeulen 2002; Browning, Chiappori, and Lewbel 2013).

utility assumptions, there is a one-to-one relationship between the Pareto weights and the resource shares.¹⁰ Hence, the resource shares are a proxy for an individual's bargaining power in the intra-household allocation stage.

3.2 Household Budget Shares

The demand function for each good k derived from the maximization of equation (1) can be expressed as a household budget share W^k , a function of prices, total expenditure, and household characteristics. Let ω_i^k be the hypothetical budget share we would observe if individual i would independently maximize her own utility with respect to the shadow price vector ($A'p$) and shadow income ($\eta_i y$).

I parametrize the individual budget shares ω_i^k assuming price-independent generalized logarithm (PIGLOG) preferences,¹¹ a widely used parametrization in the literature.¹² The Almost Ideal Demand System (AIDS, Deaton and Muellbauer (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 the log of

¹⁰Let $\tilde{p}^k = A^k p^k$. The first-order conditions of the household maximization problem in (1) imply:

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

The first-order conditions from the wife's and the husband's individual problems, the envelope theorem, and equation (4) imply:

$$\begin{aligned} \frac{\lambda_h}{\lambda_w} &= \left(\frac{\partial U_h / \partial x_h^k}{\partial U_w / \partial x_w^j} \right) \left(\frac{\tilde{p}^j}{\tilde{p}^k} \right) \quad \forall k, j = 1, \dots, K \\ \frac{\mu(p, y)}{(1 - \mu(p, y))} &= \frac{\partial V^h(A'p, (1 - \eta(p, y))y)}{\partial(1 - \eta(p, y))y} \Big/ \frac{\partial V^w(A'p, \eta(p, y))y}{\partial \eta(p, y)y} \end{aligned}$$

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

¹¹The 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: $\alpha_i^k(p) = p^k \left(\frac{\partial F_i(p)}{\partial p^k} \ln(G_i(p)) + \frac{1}{G_i(p)} \frac{\partial G_i(p)}{\partial p^k} \right)$; $\beta_i^k(p) = -p^k \frac{\partial F_i(p)}{\partial p^k}$.

¹²See, among many others, Attanasio and Lechene (2010), Dunbar, Lewbel, and Pendakur (2013), Attanasio and Lechene (2014), Sokullu and Valente (2018), Brown, Calvi, and Penglase (2019), Calvi (2020), Penglase (2020), and Hoehn-Velasco and Penglase (2021).

expenditure:

$$\omega_w^k = \alpha_w^k + \beta_w^k \ln(\eta_w y) \quad \forall k = 1, \dots, K \quad (5a)$$

$$\omega_h^k = \alpha_h^k + \beta_h^k \ln(\eta_h y) \quad \forall k = 1, \dots, K. \quad (5b)$$

Given the linear consumption technology, the household budget shares W^k can be expressed as a weighted sum of the individual budget shares ω_i^k , where the weights are the bargaining power of each individual represented by their resource share η_i :

$$W^k = \eta_w \omega_w^k + \eta_h \omega_h^k \quad \forall k = 1, \dots, K. \quad (6)$$

This means that both the intercept and slope parameters in the standard household Engel curve equations are a function of both the household members' individual preferences and of the distribution of bargaining power within the household:

$$W^k = \alpha^k + \beta^k \ln(y) \quad (7)$$

$$\alpha^k = \eta_w (\alpha_w^k + \beta_w^k \ln(\eta_w)) + \eta_h (\alpha_h^k + \beta_h^k \ln(\eta_h)) \quad (8)$$

$$\beta^k = \eta_w \beta_w^k + \eta_h \beta_h^k \quad \forall k = 1, \dots, K. \quad (9)$$

There is a type of goods for which the Engel curves are simpler. These are private assignable goods. The household consumption of a private assignable good is equal to the private equivalent consumption of this good. 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. For ease of exposition, assume the wife and the husband are the only adults in the household.¹³ Let Γ_w and Γ_h be the vectors of the private assignable goods of the wife and the husband, respectively, with $|\Gamma_w| + |\Gamma_h| \leq K$. Then, the household's budget shares of these private assignable goods can be expressed as:

¹³This assumption will be relaxed in the empirical part of the paper.

$$W_w^k = \eta_w \omega_w^k = \eta_w [\alpha_w^k + \beta_w^k \ln(\eta_w y)] \quad \forall k \in \Gamma_w \quad (10a)$$

$$W_h^k = \eta_h \omega_m^k = \eta_h [\alpha_m^k + \beta_m^k \ln(\eta_h y)] \quad \forall k \in \Gamma_h. \quad (10b)$$

3.3 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).^{14,15} 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

¹⁴The outside option has also been modeled as the non-cooperative solution instead of divorce (Lundberg and Pollak 1993).

¹⁵The 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).

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.

4 Data and Empirical Strategy

4.1 Homicide Data

The local crime data come from the National Institute of Statistics and Geography (INEGI). I measure exposure to local crime with the homicide rate per 100,000 people at the municipality level. The use of the homicide rate can be thought as a proxy for the general escalation in insecurity and crime victimization that occurred in Mexico during the relevant time period. Homicides do not capture the whole crime environment civilians are exposed to, but they are much less subject to misreporting bias than other crime data. The trend in homicides also matches the available data on other crime activities, such as extortions and kidnappings (Heinle, Molzahn, and Shirk 2015).

In the main empirical analysis, I apply the quartic root transformation to the homicide rate. The quartic root serves as proxy for a logarithmic transformation for positive numbers avoiding either dropping zeroes or adding an arbitrary small amount. 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. In section 5.3, I also show the main results are robust to the logarithmic and inverse hyperbolic sine transformations, and that the results also hold qualitatively using the homicide rate without any monotonic transformation.

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 survey (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 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). The survey is representative at the national level of the Mexican population, and for urban and rural areas within regions at baseline. It is also geographically representative of the increase in homicides over the period. Velasquez (2019) documents the lack of statistically significant differences in the change in violence across MxFLS and non-MxFLS municipalities. Appendix Table A1 also shows the MxFLS municipalities included in this paper’s main analytical sample are not statistically different in terms of the rise in the homicide rate.¹⁶

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

¹⁶The dependent variable in Table A1 is the change in the homicide rate between 2005 and 2010. The coefficient of interest is an indicator variable if the municipality is included in this paper’s MxFLS sample. The point estimate is very small (-0.19 homicides per 100,000 people) and not statistically different from zero.

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 MxFLS-2 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, about 40% of the wives and husbands have achieved secondary education or higher, and the average household size is 4.49 members. Appendix Table A2 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 in 2005–2006. Each of the rows in columns (2) to (4) 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

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 [13.22]	-1.19*** (0.42)	-0.01 (0.02)	0.45 (0.34)
Husband's age	45.67 [14.02]	-1.33*** (0.46)	-0.00 (0.02)	0.74* (0.45)
Age gap	3.42 [5.26]	-0.14 (0.13)	0.01 (0.01)	0.28 (0.19)
Wife's secondary	0.40 [0.49]	0.07*** (0.02)	0.00 (0.00)	-0.01 (0.02)
Husband's secondary	0.42 [0.49]	0.06*** (0.02)	-0.00 (0.00)	-0.02 (0.02)
Number of children	2.24 [1.56]	0.01 (0.06)	-0.00 (0.00)	-0.06 (0.05)
Average age children	14.23 [9.18]	-0.38 (0.30)	-0.01 (0.01)	0.08 (0.24)
Share of daughters	0.50 [0.36]	0.01 (0.01)	-0.00 (0.00)	-0.00 (0.01)
Rural locality	0.42 [0.49]	-0.15*** (0.05)	0.00 (0.00)	0.10* (0.05)
Household size	4.69 [1.93]	0.01 (0.07)	-0.00 (0.00)	-0.07 (0.06)
Nuclear household	0.79 [0.41]	0.01 (0.01)	-0.00 (0.00)	-0.01 (0.01)
Domestic partnership	0.15 [0.35]	0.01 (0.01)	0.00 (0.00)	0.01 (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 (1)	Violence variables		
		$\sqrt[4]{H_{m2005}}$ (2)	ΔH_m (3)	$\Delta \sqrt[4]{H_m}$ (4)
Total expenditure	59,565.98 [45,738.69]	4,166.74* (2,196.99)	77.56 (70.37)	476.88 (2,143.59)
Ln(total expenditure)	10.74 [0.72]	0.08* (0.04)	0.00* (0.00)	0.03 (0.04)
Food	56.27 [18.36]	-1.56* (0.92)	0.04 (0.03)	1.38 (0.85)
Drinks and Tob.	3.50 [4.26]	-0.11 (0.19)	0.01** (0.01)	0.27 (0.18)
Male clothing	1.50 [2.72]	0.06 (0.07)	-0.00* (0.00)	-0.08 (0.06)
Female clothing	1.54 [2.75]	-0.06 (0.08)	-0.00 (0.00)	0.00 (0.07)
Children goods	1.90 [3.43]	-0.05 (0.10)	0.00 (0.00)	0.05 (0.10)
Hygiene, personal care	5.90 [4.82]	-0.12 (0.17)	0.00 (0.01)	0.07 (0.11)
Other household goods	13.23 [10.04]	0.47 (0.37)	-0.01 (0.01)	-0.35 (0.30)
Transportation	9.87 [12.20]	0.89** (0.40)	-0.01 (0.02)	-0.71 (0.52)
Health	1.65 [5.08]	0.01 (0.15)	-0.00 (0.00)	-0.08 (0.14)
Education	2.07 [3.82]	0.16* (0.09)	-0.01*** (0.00)	-0.31*** (0.07)
Recreation	2.52 [6.16]	0.28* (0.16)	-0.01 (0.01)	-0.21 (0.17)
Gambling	0.05 [0.45]	0.02** (0.01)	-0.00** (0.00)	-0.02** (0.01)
Shares joint eq. test (p)		0.12	0.01	0.00
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 the expenditure share on the homicide rate in 2005–2006 MxFLS-2. Column (3) reports an OLS coefficient of a regression 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.

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) show 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. We 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, see Table A3 for a detailed description of each of the goods included in the analysis. 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,¹⁷ 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. The methodology used to estimate total expenditure is similar to the one used by, among others, Bobonis (2009), Attanasio and Lechene (2010), and Attanasio and Lechene (2014) in their estimation of Engel curves for

¹⁷This category includes alcoholic beverages as well as juices, purified water, and powder for preparing water.

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 PPP¹⁸). The largest expenditure share is food, accounting for almost 60% of total household expenditures in the sample. Appendix Table A4 shows the equivalent numbers when restricting the sample to nuclear households with children.

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), again consistent with living in more urban areas. In columns (3) and (4), we see 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 we fail to reject the null hypothesis of joint significance across budget shares, it highlights the importance of using a longitudinal survey that provides the ability to control for initial household characteristics.

4.3 Empirical Strategy

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 with the inclusion of household fixed effects which allows controlling for any time-invariant household characteristics potentially correlated with both the trends of violence and of the households' budget shares.

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 will show below the results are consistent throughout multiple

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

robustness checks including, among others, flexibly allowing for non-linear specifications of time-varying controls and a placebo exercise to test for unobserved municipality trends.

The longitudinal nature of the MxFLS data and the restriction to previously married households allow to isolate the effects that the rise in violence may have had on selection into marriage. But two other sources of sample selection may still raise concerns: non-random attrition and selective migration.

4.3.1 Non-random 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 attrition bias if the probability of individuals being reinterviewed in the MxFLS-3 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 and that this null effect does not seem to mask heterogeneity based on household characteristics (Table A33). To alleviate further concerns, I delve into the potential sources of attrition. There is no evidence of the increase in crime affects the A34). Finally, as appointed by Berniell, de la Mata, and Machado (2020), and the findings in Hernandez-de Benito (2020), it is important to test for the assumption of marriage stability especially when we will want to interpret the effects as changes in bargaining power as I do in section 6. Appendix Table A35 shows the the increase in crime has no effect on the overall probability of not being married in MxFLS-3 for either the head of the household or spouse as defined in MxFLS2, with the exception of a higher probability of female widows consistent with the drastic male victimization brought by the Mexican drug war (section 2).

4.3.2 Selective migration

Previous research has found effects of the Mexican drug war on migration behavior (Basu and Pearlman 2017; Orozco-Aleman and Gonzalez-Lozano 2018). The results of this paper could be biased if migrants and non-migrants have different charac-

teristics, 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.

To deal with the suggestive evidence of selective migration, I implement an “intention-to-treat” approach. 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; Brown et al. 2018; Velasquez 2019). Given this intention-to-treat approach, the household fixed effects also effectively control for any time-invariant characteristics at the municipality level.

5 Effect of Violence on Household Expenditures

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

$$\ln(y_{ijt}) = \alpha + \gamma H_{jt} + \Theta D_{ijt} + \lambda_t + \delta_i + \epsilon_{ijt} \quad (11)$$

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 , 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 follow-

¹⁹As 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		Nuclear households	
	(1)	(2)	(3)	(4)
\sqrt{V} Homicide rate last 12 months	0.027 (0.024)	-0.018 (0.022)	0.011 (0.023)	-0.009 (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.

ing: 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 A2).

I then test whether the increase in local violence in Mexico had any effects on household decision-making with respect to expenditure allocations. 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 the composition of such expenditure. I estimate a system of households' Engel curves parametrizing and adding an error term to each equation of (7):

$$W_{ijt}^k = \alpha^k + \beta^k \ln(y_{ijt}) + \gamma^k H_{jt} + \Theta^k D_{ijt} + \lambda_t^k + \delta_i^k + \epsilon_{ijt}^k \quad (12)$$

where W_{ijt}^k 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_i^k are household fixed effects; λ_t^k are year-of-interview fixed effects; and ϵ_{ijt}^k are conditionally mean-zero errors.

5.1 Estimation Strategy

I estimate the set of Engel curves specified in (12) 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 in the context of the Mexican drug war.

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, we 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 A24 presents the 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 (12) 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 double-lasso methodology 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.²⁰ 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_{ijt}^k 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

²⁰I 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 variables post selected by lasso can vary across the different demand regressions.

opportunity to find confounders (Belloni, Chernozhukov, and Hansen 2013).²¹

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 (Table 3), which alleviates concerns of misspecification bias. However, if we are interested in an unbiased estimation of β^k , we need to address the potential endogeneity of total expenditure.²² 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.²³

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 A37 and A38 for the whole sample and the nuclear households subsample, respectively.²⁴ The instrumentation of contemporaneous expenditure with contemporaneous wealth in the presence of house-

²¹The 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.

²²Households 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.

²³The 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.

²⁴The 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 5.3.

hold fixed effects also requires the lack of unobserved trends 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).

5.2 Results

Tables 4 and 5 present the results of the household Engel curves specified in (12). Table 4 presents the estimates on the log of total expenditure (β^k) and 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 and column (4) also includes state- and rural-time linear trends to control for unobserved prices. Appendix Table A5 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. Expenditure elasticities are calculated in the standard form for Working-Leser Engel curves (Armand et al. 2020; Vreyer, Lambert, and Ravallion 2020).²⁵ The expenditure elasticities of food and hygiene goods (at the mean sample values) are equal approximately equal to 0.7 (Table A6). The estimates also suggest the

²⁵The 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:

$$\frac{\partial \ln(W^k y)}{\partial \ln(y)} = \frac{\partial \ln(W^k y)}{\partial y} y = 1 + \frac{\beta^k}{W^k} \quad (13)$$

Table 4: Engel Curves: Coefficients on Log Expenditure

	(1)	(2)	(3)	(4)
Food	-12.68*** (0.59)	-16.68*** (3.75)	-16.36*** (3.66)	-16.41*** (3.88)
Drinks and Tobacco	-0.25* (0.14)	-0.14 (0.90)	-0.03 (0.91)	-0.01 (0.97)
Male adult clothing	0.68*** (0.10)	1.92*** (0.63)	2.02*** (0.63)	2.02*** (0.65)
Female adult clothing	0.71*** (0.10)	1.33* (0.80)	1.28 (0.79)	1.18 (0.82)
Children goods	0.49*** (0.15)	1.19 (0.75)	1.11 (0.71)	1.10 (0.77)
Hygiene and care	-0.63*** (0.18)	-1.57 (1.27)	-1.44 (1.21)	-1.58 (1.26)
Other hh goods	1.69*** (0.48)	1.24 (2.45)	1.21 (2.43)	1.06 (2.57)
Transportation	6.42*** (0.41)	8.18*** (2.29)	7.92*** (2.21)	8.39*** (2.34)
Health	1.73*** (0.23)	0.80 (0.94)	0.64 (0.89)	0.57 (0.93)
Education	-0.55*** (0.10)	0.48 (0.70)	0.33 (0.67)	0.31 (0.71)
Recreation	2.31*** (0.18)	3.12** (1.25)	2.87** (1.21)	2.85** (1.25)
Gambling	0.08** (0.03)	0.12 (0.10)	0.14 (0.09)	0.16 (0.10)
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 4 reports coefficient β^k on $\ln(y)$ of each demand equation (12). 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** (0.45)	-1.15** (0.49)	-1.18** (0.48)	-0.93* (0.54)
Drinks and Tobacco	0.05 (0.14)	0.06 (0.14)	0.05 (0.14)	-0.21 (0.19)
Male adult clothing	0.21*** (0.06)	0.23*** (0.08)	0.20*** (0.07)	0.23*** (0.08)
Female adult clothing	0.06 (0.07)	0.07 (0.07)	0.06 (0.07)	0.06 (0.09)
Children goods	-0.07 (0.13)	-0.06 (0.14)	-0.08 (0.14)	0.03 (0.16)
Hygiene and care	-0.43*** (0.15)	-0.45** (0.17)	-0.41** (0.17)	-0.36* (0.19)
Other hh goods	0.20 (0.27)	0.20 (0.31)	0.26 (0.29)	-0.03 (0.36)
Transportation	0.58** (0.29)	0.61** (0.29)	0.62** (0.30)	0.93*** (0.32)
Health	0.26* (0.15)	0.24 (0.16)	0.27* (0.15)	0.25 (0.21)
Education	0.06 (0.08)	0.08 (0.09)	0.08 (0.09)	0.11 (0.10)
Recreation	0.13 (0.17)	0.15 (0.19)	0.13 (0.18)	-0.09 (0.19)
Gambling	0.02* (0.01)	0.02* (0.01)	0.02* (0.01)	0.02 (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 (12). 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.

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.

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 according to their estimated elasticities (Table 4). 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 ($\hat{\gamma}^k * \sqrt[4]{15}$). Relative to the baseline average expenditure shares (Table 2), the increase in crime lead to a decrease of 4% in food and 15% in hygiene and other household necessities. The effect on food expenditure does not seem to be driven by any particular food category, such as fruits and vegetables versus meat and dairy, 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 A8, A7). The break-up results of the hygiene and care goods are further discussed below when discussing the effects on male and female goods, but the overall effect is mostly driven from a decrease in the expenditure of gender-neutral household necessities (Table A10).

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. 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, a 30% increase of a 2005–2006 average. The result is almost identical across nuclear and non-nuclear households. In contrast, the effect of homicides on adult female clothing is small in terms of point estimates and not statistically significant across specifications.

The hygiene and personal care goods budget share can be split further in house-

hold goods, women care goods, and men care goods. Tables A9 and A10 replicate the results splitting the budget share in the three categories. Reading point estimates, the effect on household personal care goods is the largest and most statistically robust. The point estimates on female and male care goods are also negative, but smaller, and the latter is not as robust. I show in the Appendix 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.

Finally, 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).

Effect of violent crime on other luxury 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. There is some evidence that the results on transportation may be driven by school transportation (Table A11). But the MxFLS data does not allow to disentangle whether these results may reflect households adapting routes and modes of transportation in response to the increases in the risk of victimization, or if it is driven by schools raising the cost of transportation in response to the increase in insecurity. With respect to the suggestive evidence of some increase in expenditures in health, as shown in the Appendix, I fail to find any evidence that the increase in crime led to an increase in wives' and husbands' reported expenditures in medicine or healthcare, or increments in medical visits or hospitalizations. The exception is some evidence of an increase in the probability of having private medical insurance to help pay the costs of health services which may be consistent with the reported increases in fear of victimization and risk aversion (Brown et al. 2018).

5.3 Threats to identification and other 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. To assess the plausibility of this source of bias, 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. Indeed, the results show that the effect of violence on the budget shares is never simultaneously statistically significant and of the same sign as in the main results (Table A12).

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, these 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 several local economic conditions could be confounding the results, especially given the occurrence of the Great Recession between the two survey waves, although 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 (12) with local economic controls to alleviate concerns about municipality-level confounders. First, I add a large number of economic municipality controls.²⁶ Second, I implement post-double-lasso allowing

²⁶The 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 am grateful to Enamorado et al. (2016) for making the inequality and poverty data and descriptions publicly available.

for a flexible functional form of the controls including higher polynomial orders and interactions among the household and municipality controls. Table A13 shows the estimated effects on food and male clothing budget shares are robust to the inclusion of municipality economic controls. Third, I show in Appendix the results are robust to excluding one state at the time, given states were likely differentially affected by the economic recession.

Randomization-based inference To analyze the likelihood that the main results could have occurred by chance, I also generate randomness in the exposure to increased local violence and calculate randomization-based p-values (Athey and Imbens 2016; Young 2019). It consists on randomly reassigning 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.²⁷ 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 A5. 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 further confirming the main results.

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 signif-

²⁷Young (2019) finds no appreciable changes in rejection rates after 2,000 repetitions.

icance 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.²⁸ 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. For instance, Vreyer, Lambert, and Ravallion (2020) include Mundlak effects in the estimation of household Engel curves in Senegal. This approach is also crucial for analyzing non-linear models with unobserved heterogeneity as in the estimation of resource shares in section 6.1. 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. This highlights the importance of controlling for household unobserved heterogeneity through either the inclusion of household fixed effects or Mundlak effects.

²⁸I use the *mhtreg* Stata package developed by Steinmayr (2020).

Other sample and specification robustness checks The results are also robust to relaxing several sample restrictions and using alternative specifications. The main analytical sample excludes households in the top and bottom 1% of total annualized expenditures and households who reported zero expenditure in food. These standard sample restrictions aim to shield the estimates from the influence of expenditure outliers but the results are almost identical to the inclusion of these extra set of households (Table A16).

On the right hand side, the main coefficient of interest is the quartic root of the homicide rate but, as we can see in Appendix Table A17, the results are robust to instead implementing the logarithmic and inverse hyperbolic sine transformations, and that they hold qualitatively using the homicide rate without any monotonic transformation. Also, if we instead use the quartic root of the homicide rate in the two years prior to the interview, as opposed to the last twelve months, the results survive though the point estimates are smaller.

With respect to the curvature of the Engel curves, the Engel equations in (12) assume a linear relationship between total expenditure and expenditure shares. It is important to remember that 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. Still, 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.²⁹ Table A18 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

²⁹QUAIDS 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 A3 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. These graphs also show that, except for gambling, for which the data exhibit little variation, Engel curves are not flat.

indicators of region (state and rural dummy) and time with the intercept, the log total expenditure, and log total expenditure squared.³⁰ The results on the effect of violence on households' expenditure shares are robust to the quadratic specification controlling for unobserved prices as well (Table A19).

5.4 Ruling out mechanisms

In this section, I explore and rule out a series of mechanisms that we may expect could explain the relationship found between the increase in crime and changes in household expenditures. They are household or individual characteristics that we could expect, either from a theoretical perspective or prior empirical evidence, to have a relationship with expenditure allocations and that may also be affected by changes in local crime.

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 A20 splits the budget shares into purchased and gifts/self-production and shows it is the household purchases that drive the reported 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 A26 shows the measure of local violence does not predict changes in the number and type of

³⁰In 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.

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 effects on the expenditure shares on food and other necessities along with 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' total resources. I assess whether the increase in homicide rates is actually masking an increase in households' standard of living not fully captured by controlling by total expenditure (which would be underestimated). 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 already alleviates largely these concerns. In addition, Appendix Table A21 also shows that the increase in homicides rates does not predict any changes in household's measures of 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.

Survey interview process The consumption module of the MxFLS survey is completed by a household member that is above 18 years old and "who knows about the characteristics of all household members". In 95% of the sample, it is either the head of the household or the spouse who completes the section. In 83% of the cases is the female spouse of the head of the household. We may worry the increase in crime has affected who is the person who completes the survey which could be a problem if men and women have different recall bias for different goods,

or if they hide expenditures from each other that are otherwise willing to report to the survey enumerators. The Engel curve results are robust to limiting the sample to households where the person who fills the consumption survey is the same across survey waves (Table A22). In addition, if we worry about non-random changes in bystander effects, there is also no evidence of the increase in crime affecting who is present at the time of the interview, regardless if it is the wife or the husband who completes the consumption module (Table A27).

Male time allocations 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 and I provide further empirical evidence supporting this hypothesis in section 6. But an alternative explanation could be that there are crime-induced changes in time allocations that 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, or simply the time men spent outside the household, then households might need to spend more in male 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 A28). 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. Finally, the MxFLS also includes a time allocation module that asked how many hours respondents spent in a series of activities during the last week and there is no evidence the increase in crime increased the amount of hours the sample's men

spent participating activities outside the household (Table A29).

6 The Effect on Intra-Household Bargaining Power

The main results presented in section 5 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).

But 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. In Appendix A.6, 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 (10b). Next, I provide evidence in favor of the results been, at least partly, driven by declines in women's bargaining power. First, I structurally estimate the effect of homicide rates on women's resource shares, allowing for homicides to affect both preference and bargaining power parameters. Second, I provide evidence of a decrease in women's intra-household decision-making power.

6.1 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.³¹ The computation of resource shares will derive from the slope of the Engel specified in equations (10a) and (10b). In the absence of further preference assumptions, the system of Engel curves specified in equations (10a, 10b) 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 (10a) and (10b) can be identified by linear regressions on an intercept and $\ln(y)$, and they are proportional to the resource share η .

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. But this conclusion is not necessarily true when we just restrict the slope β .³²

³¹Adult 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.”

³²In Figure A6, 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

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 5.3). The empirical implementation is the following:

$$W_{it}^w = \eta(x_{it})[\alpha^w(x_{it}) + \beta(x_{it})[\ln(\eta(x_{it})) + \ln(y_{it}/n_{it}^w)] + \theta^w \bar{x}_i] \quad (14a)$$

$$W_{it}^m = (1 - \eta(x_{it}))[\alpha^m(x_{it}) + \beta(x_{it})[\ln(1 - \eta(x_{it})) + \ln(y_{it}/n_{it}^m)] + \theta^m \bar{x}_i] \quad (14b)$$

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.³³

6.1.1 Estimation strategy and results

The model is implemented by adding an error term to equations (14a) and (14b) 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

$\eta > 0.5$ and $W_w^2 < W_h^2$. Therefore, using $\frac{W_w^k}{W_h^k} \geq 1$ to determine $\eta \geq 0.5$ 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.

³³For instance, 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 (2021) 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.

male above 18 years old.

Figure 3 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).

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. 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. In households that experienced the average increase in crime during the period, women's resource shares are estimated to decrease by 5 percentage points consistent with the hypothesis that increases in local crime negatively affects women's intra-household bargaining power.

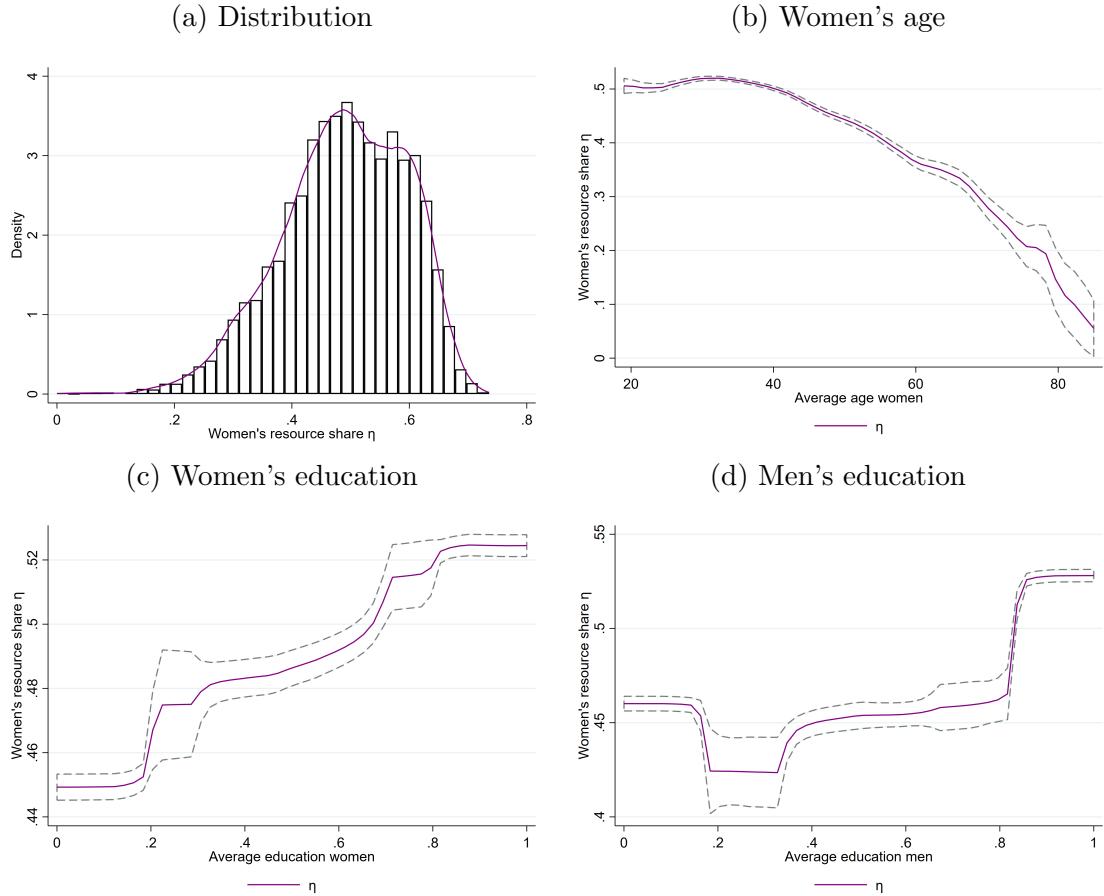
6.2 The Effect on Intra-household Decision-Making

In this section, I show that households themselves report changes in the decision-making process with respect to household purchases. The MxFLS survey asks the head of the household and the spouse separately who generally makes the decisions regarding different household purchases.³⁴ I build two indicator variables based on the wife's and husband's responses with respect to decision m : $DM_i^m = \mathbf{1}\{i \text{ says } i \text{ decides over } m\}$ and $SD_i^m = \mathbf{1}\{i \text{ says spouse decides over } m \text{ and } i \text{ does not}\}$.

I estimate the effect of homicide rates on intra-household decision-making power with a series of individual fixed-effects specifications whose coefficient of interest

³⁴Tsaneva, 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.

Figure 3: Average Predicted Women's Resource Shares



Notes: The figure plots the average predicted women's resource share. Figure 3a plots the distribution of the average predicted shares. Figures 3b, 3c, 3d 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.

Table 6: Determinants of Women's Resource Shares

	(1) All households β	(2) $\beta(x_{ijt})$	(3) All households β	(4) $\beta(x_{ijt})$
\sqrt{H} Homicide rate last 12 months	-0.02 (0.02)	-0.03** (0.02)	-0.02 (0.02)	-0.02 (0.02)
Intercept	0.45*** (0.15)	0.31** (0.15)	0.51*** (0.12)	0.48*** (0.12)
MxFLS3	-0.03 (0.02)	-0.05** (0.02)	-0.02 (0.02)	-0.01 (0.02)
Average age all adult women	0.00 (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (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)	0.01* (0.01)	0.00 (0.01)	0.00 (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 (0.02)	0.03 (0.02)	0.01 (0.03)	-0.03 (0.03)
Average education adult men	0.07** (0.03)	0.04 (0.03)	0.05 (0.03)	0.04 (0.03)
# household members ≤ 18	0.01 (0.01)	0.00 (0.01)	0.01* (0.01)	-0.00 (0.01)
Rural locality	-0.12*** (0.03)	-0.11*** (0.02)	-0.12*** (0.03)	-0.10*** (0.02)
Central region	0.04 (0.04)	0.03 (0.04)	0.02 (0.03)	0.04 (0.03)
North region	-0.11*** (0.04)	-0.13*** (0.04)	-0.10*** (0.03)	-0.09*** (0.03)
West region	0.03 (0.04)	-0.01 (0.04)	-0.00 (0.04)	-0.00 (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 coefficients of the household characteristics on the preference parameters $\alpha^w, \alpha^m, \beta$ are available upon request.

is again the quartic root of the homicide rate.³⁵ Table 7 shows the results are consistent with the effects found on consumption allocations and women’s resource shares. Exposure to local violence has 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. The opposite effect arises 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 where they are more likely to say they make decisions over their own clothes while their wives do not.

These results are also important in quantitative terms. 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. Applying the same empirical exercise to men’s answers, they are 7.28 percentage points more likely to report their wives have lost decision-making power to them with respect to his clothing.

Recent literature on women’s empowerment shows that intra-household disagreements over decisions also matter for women’s well-being and their children (Ambler et al. 2021; Annan et al. 2021). Women “taking power” versus “given power” seems

³⁵I 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 $Y_{ijt}^m \in \{DM_{ijt}^m, SD_{ijt}^m\}$ 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 ϵ_{ijt}^m is a conditionally mean-zero error clustered at the municipality level.

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 (0.009)	0.013* (0.007)	0.022 (0.024)	-0.022 (0.025)
Wife's clothes	-0.018** (0.008)	0.020*** (0.007)	-0.012 (0.025)	0.022 (0.025)
Husband's clothes	-0.046** (0.022)	0.051** (0.022)	0.037*** (0.012)	-0.035*** (0.012)
Large expenditures	-0.043** (0.019)	0.051*** (0.019)	0.006 (0.011)	-0.001 (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.

to capture an important aspect of empowerment. Following Annan et al. (2021), 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. Appendix Table A30 shows the increase in violence increases the probability of women being “given power” from their husbands with respect to food and their own clothing. Importantly, there is no effect on spousal disagreements with respect to male clothing, because they both declare a shift toward men having more power as violence increased. Hence, the results on the directionality of spousal disagreements are consistent with the conclusions drawn from Table 7.

The interpretation of self-reported decision-making as a measurement of intra-

household bargaining power or agency is well-extended in the literature although it presents several limitations (Seymour and Peterman 2018; Donald et al. 2020; Peterman et al. 2021). However, taken together with the previous set of results, they provide further evidence of the hypothesis that exposure to local violence led women to lose capacity to decide over the households' consumption.

7 Discussion

To recap, this paper provides robust evidence that violent crime can negatively affect women's intrahousehold bargaining and decision-making power. An extensive body of theoretical and empirical research suggest that a deterioration in women's outside options may be at play. It is well documented that the Mexican drug war had a negative effect on female labor participation (Dell 2015; Utar 2018; Velasquez 2019). For instance, Velasquez (2019) finds a decrease in the number of hours worked by self-employed women but no effects on men using the MxFLS data, including both married and non-married individuals in the analysis.

These gendered impacts on labor participation are plausibly driven in part 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. But it may also be driven by women having a greater fear of crime, a phenomenon reported in many other settings (Ferraro 1996; Mesch 2000; Chataway and Hart 2019).³⁶ In fact, Velasquez (2019) also finds that the negative effects on hours worked are much stronger for women who report fear of been assaulted, whereas these effects are not present in men. Within this paper's analytical sample, the increase in crime also had a greater effect on women's fear of victimization than men's (Table A25). The rise in homicides increases the probability that women are afraid to be attacked at night, lowers the probability of feeling safer than five years ago,

³⁶There are several theories on why women's fear of crime is greater than men's, even in contexts where men suffer greater rates of victimization. One common hypothesis is that fear of crime is reflecting fear of sexual assault (Ferraro 1996). Another hypothesis is that women are more likely to express fear not only for themselves but for what happens to their children (Mesch 2000).

and increases the probability of expecting an attack within the next three years. The increase in homicides also makes men feel less safe, but there is no statistically significant effect on how scared they are of been attacked and the point estimates are statistically insignificant and smaller than women's across the board.

Heterogeneity analysis of the effects of crime on household expenditures suggest that women's fear of victimization plays a role in the decline of their bargaining power presented in this paper (Appendix Figure A7). The patterns of the heterogeneous effects are starker when we restrict the sample to nuclear households with children (Figure A8). The reported effects of homicides on food and male clothing are stronger in those households whose wives report being more scared of victimization than before. And, interestingly, there is evidence of an increase in the budget share of alcohol and tobacco in such households as well, a good previously found to be negatively correlated with women's bargaining power in Mexico (Angelucci 2008; Bobonis 2009). There is no evidence that this effect is driven by either the wives or husbands being more likely, as a consequence of the increase in crime, to drink alcohol with food at home or to smoke cigarettes (Tables A31, A32). If anything, there is a decrease in women saying they like to drink alcohol at social gatherings which may be correlated with their greater fear of victimization if they perceive more vulnerability while inebriated.³⁷

The relationship between women's fear of victimization and bargaining power may operate through multiple channels. Women's earnings capacity through labor markets is of course an important candidate, especially given previous findings. In this paper's sample, where three fourths of the married women were already not working prior to the escalation in crime, the direct effect is bound to be limited. Still, heterogeneity analysis suggests that the effects on the expenditures on household necessities and male clothing are not present among those women who work more than at baseline, and for this group, there is an increase in the expenditures on

³⁷This is consistent with previous findings on the Mexican drug war increasing risk aversion (Brown et al. 2018; Nasir, Rockmore, and Tan 2020) and reducing risk-taking behavior (Manian 2021).

female adult clothing (Figures A7,A8). Of course we need to be careful interpreting these effects causally given the restricted sample size and the stronger assumptions required on the identification strategy. But indirect effects may lower women's bargaining power even for those who were not working before by limiting their outside options, as separation may become more costly, a channel further explored in Hernandez-de Benito (2020).

Beyond labor markets, women's increased fear of crime may also operate limiting the time spent outside the household in non-working activities. As opposed to the men in the sample, the increase in homicides negatively affected the number of hours women spend outside the household in sports, cultural, or entertainment activities (Table A28). This might shrink women's capacity to join, or interact with existing, empowering social networks (Oster and Thornton 2012; Kandpal and Baylis 2019; Andrew et al. 2020). A reduction in the time spent outside the household may also decrease the frequency of women commuting to markets to purchase households' goods, potentially allowing men to reallocate the budget towards their preferred commodities. Neither the social networks nor the market buyer channels can be tested with the MxFLS data, but given their policy implications, they should be subject of future research.

Finally, psychological effects might be at play as well. There is extensive research documenting that women and men can have different reactions to acute stress (Taylor and Updegraff 2000; Tamres, Janicki, and Helgeson 2002; Wang and Detre 2007). Angelucci and Cordova (2018), in a lab experiment in the US, find that acute stress reduces women's productivity and changes their decisions leading to income losses not found in men. At the same time, there is evidence suggesting women's depression levels have gone up during the Mexican drug war (Balmori de la Miyar 2020). While there is a growing body of research linking mental health and labor market outcomes (Peng, Meyerhoefer, and Zuvekas 2013; Böckerman et al. 2017), little is known on how it may affect individuals' willingness and capacity to participate in their household's decision-making process.

8 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 Appendix Tables

Table A1: Comparison of the Change in the Municipal Homicide Rate Between Municipalities Included and Excluded in the MxFLS Sample

Change from 2005 to 2010	
	(1)
MxFLS sample	-0.196 (3.393)
Intercept	12.532*** (1.855)
Observations	2,454
adj. R^2	-0.00

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors reported in parentheses.

Table A2: Descriptive Statistics: Household Characteristics in 2005–2006. Nuclear Households with Children.

	Mean and standard deviation (1)	Violence variables		
		$\sqrt[4]{H_{m2005}}$ (2)	ΔH_m (3)	$\Delta \sqrt[4]{H_m}$ (4)
Wife's age	38.37 [11.08]	-0.56 (0.37)	-0.02* (0.01)	0.08 (0.34)
Husband's age	41.62 [12.03]	-0.67 (0.44)	-0.02 (0.01)	0.26 (0.45)
Age gap	3.25 [5.17]	-0.11 (0.19)	0.00 (0.01)	0.18 (0.25)
Wife's secondary	0.47 [0.50]	0.06*** (0.02)	0.00 (0.00)	-0.00 (0.02)
Husband's secondary	0.49 [0.50]	0.05** (0.02)	0.00 (0.00)	-0.01 (0.02)
Number of children	2.56 [1.35]	-0.06 (0.07)	-0.00 (0.00)	-0.02 (0.06)
Average age children	12.06 [8.11]	-0.31 (0.26)	-0.01 (0.01)	0.13 (0.23)
Share of daughters	0.49 [0.36]	0.01 (0.01)	-0.00 (0.00)	-0.01 (0.01)
Rural locality	0.40 [0.49]	-0.14*** (0.05)	-0.00 (0.00)	0.08 (0.05)
Household size	4.56 [1.35]	-0.06 (0.07)	-0.00 (0.00)	-0.02 (0.06)
Domestic partnership	0.15 [0.36]	-0.00 (0.02)	0.00 (0.00)	0.01 (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 regression 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 A3: 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 A4: Households' expenditure descriptive statistics in 2005-2006. Nuclear households with children.

	Mean and standard deviation (1)	Violence variables		
		$\sqrt[4]{H_{m2005}}$ (2)	ΔH_m (3)	$\Delta \sqrt[4]{H_m}$ (4)
Total expenditure	59,565.98 [45,738.69]	4,166.74* (2,196.99)	77.56 (70.37)	476.88 (2,143.59)
Ln(total expenditure)	10.74 [0.72]	0.08* (0.04)	0.00* (0.00)	0.03 (0.04)
Food	56.27 [18.36]	-1.56* (0.92)	0.04 (0.03)	1.38 (0.85)
Drinks and Tob.	3.50 [4.26]	-0.11 (0.19)	0.01** (0.01)	0.27 (0.18)
Male clothing	1.50 [2.72]	0.06 (0.07)	-0.00* (0.00)	-0.08 (0.06)
Female clothing	1.54 [2.75]	-0.06 (0.08)	-0.00 (0.00)	0.00 (0.07)
Children goods	1.90 [3.43]	-0.05 (0.10)	0.00 (0.00)	0.05 (0.10)
Hygiene, personal care	5.90 [4.82]	-0.12 (0.17)	0.00 (0.01)	0.07 (0.11)
Other household goods	13.23 [10.04]	0.47 (0.37)	-0.01 (0.01)	-0.35 (0.30)
Transportation	9.87 [12.20]	0.89** (0.40)	-0.01 (0.02)	-0.71 (0.52)
Health	1.65 [5.08]	0.01 (0.15)	-0.00 (0.00)	-0.08 (0.14)
Education	2.07 [3.82]	0.16* (0.09)	-0.01*** (0.00)	-0.31*** (0.07)
Recreation	2.52 [6.16]	0.28* (0.16)	-0.01 (0.01)	-0.21 (0.17)
Gambling	0.05 [0.45]	0.02** (0.01)	-0.00** (0.00)	-0.02** (0.01)
Shares joint eq. test (p)		0.12	0.01	0.00
Observations	4,251	4,251	4,251	4,251

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

Table A5: Effect of Homicide Rates on Expenditure Shares: Nuclear Households

		(1)	(2)	(3)
Food	ln(total expenditure)	-18.21*** (4.88)	-18.01*** (4.77)	-17.19*** (4.71)
	▽ Homicide rate last 12 months	-1.66** (0.76)	-1.33* (0.71)	-1.69** (0.85)
Drinks and Tobacco	ln(total expenditure)	-2.08* (1.08)	-1.90* (1.04)	-1.77* (1.07)
	▽ Homicide rate last 12 months	-0.07 (0.20)	-0.15 (0.20)	-0.31 (0.23)
Male clothing	ln(total expenditure)	0.99 (0.65)	0.99 (0.60)	1.02* (0.57)
	▽ Homicide rate last 12 months	0.30*** (0.11)	0.31*** (0.10)	0.19 (0.12)
Female clothing	ln(total expenditure)	1.57** (0.74)	1.47** (0.68)	1.53** (0.67)
	▽ Homicide rate last 12 months	0.21 (0.13)	0.24* (0.13)	0.22 (0.17)
Children goods	ln(total expenditure)	2.56* (1.34)	2.13 (1.32)	2.14 (1.40)
	▽ Homicide rate last 12 months	0.04 (0.20)	0.05 (0.19)	0.12 (0.25)
Hygiene and care	ln(total expenditure)	-1.22 (1.50)	-0.72 (1.34)	-0.80 (1.39)
	▽ Homicide rate last 12 months	-0.38 (0.29)	-0.30 (0.26)	-0.14 (0.32)
Other hh goods	ln(total expenditure)	5.92** (2.74)	6.04** (2.82)	5.67** (2.75)
	▽ Homicide rate last 12 months	0.26 (0.46)	0.25 (0.39)	0.11 (0.46)
Transportation	ln(total expenditure)	5.45** (2.59)	5.67** (2.70)	5.58** (2.72)
	▽ Homicide rate last 12 months	0.38 (0.53)	0.35 (0.59)	0.98 (0.71)
Health	ln(total expenditure)	2.56** (1.26)	2.09 (1.30)	2.07 (1.34)
	▽ Homicide rate last 12 months	0.50* (0.29)	0.34 (0.29)	0.11 (0.40)
Education	ln(total expenditure)	0.48 (0.79)	0.53 (0.72)	0.38 (0.75)
	▽ Homicide rate last 12 months	-0.08 (0.20)	-0.07 (0.20)	0.16 (0.20)
Recreation	ln(total expenditure)	2.11 (1.79)	1.84 (1.82)	1.61 (1.91)
	▽ Homicide rate last 12 months	0.47 (0.40)	0.38 (0.37)	0.11 (0.37)
Gambling	ln(total expenditure)	-0.13 (0.20)	-0.11 (0.18)	-0.18 (0.25)
	▽ Homicide rate last 12 months	0.02 (0.03)	0.01 (0.02)	0.03 (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 A6: Expenditure Elasticities

	All households			Nuclear households		
	Elasticity	95% Confidence Interval		Elasticity	95% Confidence Interval	
		Lower bound	Upper bound		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 A5.

Table A7: Effect of Homicide Rates within Food Basket

		(1) All households	(2)	(3) Nuclear with children	(4)
Fruit & Veg.	ln(food expenditure)	-0.0212*** (0.0036)	-0.0247 (0.0350)	-0.0180*** (0.0045)	-0.0945 (0.0615)
	▽ Homicide rate last 12 months	-0.0021 (0.0024)	-0.0022 (0.0030)	-0.0038 (0.0029)	-0.0065 (0.0043)
Cereals & Grains	ln(food expenditure)	-0.0233*** (0.0041)	-0.0454 (0.0337)	-0.0251*** (0.0051)	-0.0390 (0.0571)
	▽ Homicide rate last 12 months	-0.0018 (0.0029)	-0.0025 (0.0045)	-0.0024 (0.0033)	-0.0029 (0.0049)
Meat & Dairy	ln(food expenditure)	0.0530*** (0.0050)	0.0269 (0.0460)	0.0500*** (0.0063)	0.1047 (0.0778)
	▽ Homicide rate last 12 months	0.0021 (0.0033)	0.0012 (0.0039)	0.0069* (0.0037)	0.0088* (0.0053)
Other food	ln(food expenditure)	-0.0084** (0.0037)	0.0432 (0.0308)	-0.0068 (0.0043)	0.0288 (0.0578)
	▽ Homicide rate last 12 months	0.0017 (0.0024)	0.0034 (0.0028)	-0.0006 (0.0029)	0.0006 (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 A8: Effect of Homicide Rates on Food Type Budget Shares

		(1) All households	(2)	(3) Nuclear with children	(4)
Fruit & Veg.	ln(total expenditure)	-4.30** (1.74)	-4.24** (1.69)	-7.65*** (2.32)	-7.62*** (2.30)
	✓ Homicide rate last 12 months	-0.26 (0.20)	-0.25 (0.19)	-0.40 (0.26)	-0.35 (0.22)
Cereals & Grains	ln(total expenditure)	-4.91*** (1.52)	-4.83*** (1.45)	-4.81** (2.38)	-4.75** (2.28)
	✓ Homicide rate last 12 months	-0.35 (0.30)	-0.37 (0.28)	-0.42 (0.28)	-0.48* (0.28)
Meat & Dairy	ln(total expenditure)	-7.14** (2.96)	-7.14** (2.91)	-6.77 (4.19)	-7.44* (4.10)
	✓ Homicide rate last 12 months	-0.46 (0.31)	-0.47 (0.34)	-0.32 (0.39)	-0.36 (0.41)
Other food	ln(total expenditure)	-0.32 (1.27)	-0.15 (1.16)	-2.33 (1.78)	-2.11 (1.69)
	✓ Homicide rate last 12 months	-0.07 (0.18)	-0.08 (0.17)	-0.30 (0.21)	-0.26 (0.20)
Drinks and Tobacco	ln(total expenditure)	-0.14 (0.90)	-0.03 (0.91)	0.61 (1.34)	0.67 (1.32)
	✓ Homicide rate last 12 months	0.06 (0.14)	0.05 (0.14)	0.01 (0.13)	-0.00 (0.13)
Male clothing	ln(total expenditure)	1.92*** (0.63)	2.02*** (0.63)	1.22** (0.62)	1.28** (0.64)
	✓ Homicide rate last 12 months	0.23*** (0.08)	0.20*** (0.07)	0.24*** (0.09)	0.23*** (0.08)
Female clothing	ln(total expenditure)	1.33* (0.80)	1.29 (0.79)	0.86 (1.06)	0.86 (1.06)
	✓ Homicide rate last 12 months	0.07 (0.07)	0.06 (0.07)	0.06 (0.10)	0.08 (0.09)
Children goods	ln(total expenditure)	1.19 (0.75)	1.11 (0.72)	2.04 (1.25)	1.80 (1.18)
	✓ Homicide rate last 12 months	-0.06 (0.14)	-0.07 (0.14)	-0.10 (0.19)	-0.13 (0.19)
Hygiene and care	ln(total expenditure)	-1.57 (1.27)	-1.44 (1.21)	-0.97 (1.77)	-0.58 (1.73)
	✓ Homicide rate last 12 months	-0.45** (0.17)	-0.42** (0.17)	-0.38* (0.20)	-0.36* (0.20)
Other hh goods	ln(total expenditure)	1.24 (2.45)	1.21 (2.43)	4.85 (3.34)	4.87 (3.33)
	✓ Homicide rate last 12 months	0.20 (0.31)	0.26 (0.29)	0.58* (0.35)	0.56* (0.31)
Transportation	ln(total expenditure)	8.18*** (2.29)	7.92*** (2.21)	7.86** (3.72)	7.92** (3.55)
	✓ Homicide rate last 12 months	0.61** (0.29)	0.62** (0.30)	0.38 (0.37)	0.44 (0.36)
Health	ln(total expenditure)	0.80 (0.94)	0.64 (0.89)	2.05* (1.14)	2.13* (1.18)
	✓ Homicide rate last 12 months	0.24 (0.16)	0.27* (0.15)	0.21 (0.21)	0.16 (0.21)
Education	ln(total expenditure)	0.48 (0.70)	0.32 (0.66)	0.34 (1.22)	0.24 (1.16)
	✓ Homicide rate last 12 months	0.08 (0.09)	0.08 (0.09)	0.08 (0.13)	0.13 (0.13)
Recreation	ln(total expenditure)	3.12** (1.25)	2.87** (1.21)	2.59 (2.06)	2.55 (2.08)
	✓ Homicide rate last 12 months	0.15 (0.19)	0.14 (0.18)	0.32 (0.23)	0.30 (0.22)
Gambling	ln(total expenditure)	0.12 (0.10)	0.14 (0.09)	0.10 (0.20)	0.14 (0.19)
	✓ Homicide rate last 12 months	0.02* (0.01)	0.02* (0.01)	0.02 (0.02)	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 A9: Engel Curves: Coefficients on Log Expenditure; Household, Male, and Female Care Goods

	(1)	(2)	(3)	(4)
Food	-12.68*** (0.59)	-16.68*** (3.75)	-16.36*** (3.66)	-16.41*** (3.88)
Drinks and Tobacco	-0.25* (0.14)	-0.14 (0.90)	-0.03 (0.91)	-0.01 (0.97)
Male clothing	0.68*** (0.10)	1.92*** (0.63)	2.02*** (0.63)	2.02*** (0.65)
Female clothing	0.71*** (0.10)	1.33* (0.80)	1.28 (0.79)	1.18 (0.82)
Male care goods	0.07 (0.07)	0.96** (0.39)	0.96*** (0.36)	0.90*** (0.35)
Women care goods	0.03 (0.07)	-0.34 (0.48)	-0.32 (0.44)	-0.34 (0.46)
Children goods	0.49*** (0.15)	1.19 (0.75)	1.11 (0.71)	1.10 (0.77)
Hygiene and care	-0.73*** (0.11)	-2.18** (0.97)	-2.08** (0.96)	-2.11** (1.00)
Other hh goods	1.69*** (0.48)	1.24 (2.45)	1.21 (2.43)	1.06 (2.57)
Transportation	6.42*** (0.41)	8.18*** (2.29)	7.92*** (2.21)	8.39*** (2.34)
Health	1.73*** (0.23)	0.80 (0.94)	0.64 (0.89)	0.57 (0.93)
Education	-0.55*** (0.10)	0.48 (0.70)	0.33 (0.67)	0.31 (0.71)
Recreation	2.31*** (0.18)	3.12** (1.25)	2.87** (1.21)	2.85** (1.25)
Gambling	0.08** (0.03)	0.12 (0.10)	0.14 (0.09)	0.16 (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 (12). 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: Effect of Homicide Rates on Expenditure Shares: Household, Male, and Female Care Goods

	(1)	(2)	(3)	(4)
Food	-1.07** (0.45)	-1.15** (0.49)	-1.18** (0.48)	-0.93* (0.54)
Drinks and Tobacco	0.05 (0.14)	0.06 (0.14)	0.05 (0.14)	-0.21 (0.19)
Male clothing	0.21*** (0.06)	0.23*** (0.08)	0.20*** (0.07)	0.23*** (0.08)
Female clothing	0.06 (0.07)	0.07 (0.07)	0.06 (0.07)	0.06 (0.09)
Male care goods	-0.10* (0.05)	-0.08 (0.06)	-0.10* (0.05)	-0.06 (0.06)
Women care goods	-0.12** (0.06)	-0.13** (0.06)	-0.12* (0.07)	-0.10 (0.08)
Children goods	-0.07 (0.13)	-0.06 (0.14)	-0.08 (0.14)	0.03 (0.16)
Hygiene and care	-0.21** (0.11)	-0.24* (0.12)	-0.19 (0.12)	-0.20 (0.12)
Other hh goods	0.20 (0.27)	0.20 (0.31)	0.26 (0.29)	-0.03 (0.36)
Transportation	0.58** (0.29)	0.61** (0.29)	0.62** (0.30)	0.93*** (0.32)
Health	0.26* (0.15)	0.24 (0.16)	0.27* (0.15)	0.25 (0.21)
Education	0.06 (0.08)	0.08 (0.09)	0.08 (0.09)	0.11 (0.10)
Recreation	0.13 (0.17)	0.15 (0.19)	0.13 (0.18)	-0.09 (0.19)
Gambling	0.02* (0.01)	0.02* (0.01)	0.02* (0.01)	0.02 (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 (12). 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 A11: Effect of Homicide Rates on Expenditure Shares: Splitting Transportation Budget Share

	(1)
Food	-1.07** (0.45)
Drinks and Tob.	0.05 (0.14)
Male clothing	0.21*** (0.06)
Female clothing	0.06 (0.07)
Children goods	-0.07 (0.13)
Hygiene and care	-0.43*** (0.15)
Other hh goods	0.20 (0.27)
School transportation	0.27* (0.16)
Other transportation	0.31 (0.29)
Health	0.26* (0.15)
Education	0.06 (0.08)
Recreation	0.13 (0.17)
Gambling	0.02* (0.01) ✓ ✓ ✓
	4,251

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table A11 reports coefficient γ^k on the quartic of the homicide rate in 100,000 of each equation (12). 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 A12: MxFLS Wave 1 and Wave 2 Placebo Test

		(1) All households	(2)	(3)	(4) Nuclear with children
Food	ln(total expenditure)	-10.53*** (0.67)	-19.56*** (5.44)	-10.61*** (0.68)	-17.23*** (5.24)
	▽ Homicide rate last 12 months	1.01 (0.67)	1.54* (0.80)	0.89 (0.79)	1.21 (0.89)
Drinks and Tobacco	ln(total expenditure)	-0.35** (0.17)	0.98 (1.34)	-0.30 (0.20)	1.43 (1.32)
	▽ Homicide rate last 12 months	-0.10 (0.19)	-0.18 (0.19)	-0.14 (0.17)	-0.23 (0.18)
Male clothing	ln(total expenditure)	0.70*** (0.10)	2.74*** (0.85)	0.72*** (0.12)	1.55** (0.75)
	▽ Homicide rate last 12 months	-0.04 (0.10)	-0.16 (0.12)	-0.03 (0.12)	-0.07 (0.13)
Female clothing	ln(total expenditure)	0.60*** (0.08)	1.04 (0.68)	0.59*** (0.09)	0.91 (0.75)
	▽ Homicide rate last 12 months	-0.05 (0.11)	-0.08 (0.12)	-0.08 (0.12)	-0.09 (0.13)
Children goods	ln(total expenditure)	0.44*** (0.12)	0.28 (0.96)	0.42*** (0.15)	0.68 (1.22)
	▽ Homicide rate last 12 months	-0.24 (0.15)	-0.23 (0.17)	-0.32 (0.21)	-0.33 (0.23)
Hygiene and care	ln(total expenditure)	-0.90*** (0.17)	-1.77 (1.62)	-1.15*** (0.22)	-1.91 (1.53)
	▽ Homicide rate last 12 months	-0.01 (0.19)	0.04 (0.23)	-0.01 (0.21)	0.03 (0.24)
Other hh goods	ln(total expenditure)	0.19 (0.40)	5.35* (2.94)	-0.17 (0.41)	4.55 (3.49)
	▽ Homicide rate last 12 months	-0.26 (0.46)	-0.56 (0.59)	-0.01 (0.45)	-0.24 (0.60)
Transportation	ln(total expenditure)	6.01*** (0.42)	8.58*** (3.25)	6.35*** (0.53)	9.45*** (3.34)
	▽ Homicide rate last 12 months	0.02 (0.40)	-0.13 (0.47)	-0.04 (0.56)	-0.19 (0.61)
Health	ln(total expenditure)	1.85*** (0.27)	-0.63 (1.46)	1.70*** (0.33)	-1.34 (1.67)
	▽ Homicide rate last 12 months	-0.07 (0.20)	0.07 (0.26)	0.18 (0.24)	0.33 (0.32)
Education	ln(total expenditure)	-0.42*** (0.11)	0.12 (1.23)	-0.51*** (0.15)	-0.20 (1.56)
	▽ Homicide rate last 12 months	-0.18* (0.10)	-0.22* (0.12)	-0.28** (0.12)	-0.29* (0.15)
Recreation	ln(total expenditure)	2.33*** (0.21)	2.63 (1.65)	2.88*** (0.29)	1.65 (1.99)
	▽ Homicide rate last 12 months	-0.05 (0.14)	-0.07 (0.18)	-0.16 (0.19)	-0.10 (0.23)
Gambling	ln(total expenditure)	0.07*** (0.02)	0.22 (0.20)	0.08** (0.03)	0.46 (0.29)
	▽ Homicide rate last 12 months	-0.01 (0.01)	-0.02 (0.02)	-0.00 (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 A13: Effects of Homicide Rates on Budget Shares: Municipality Economic Controls

		(1) All households	(2)	(3) Nuclear with children	(4)
Food	ln(total expenditure)	-19.38*** (4.23)	-17.11*** (4.19)	-26.67*** (7.45)	-23.80*** (6.93)
	▽ Homicide rate last 12 months	-0.96 (0.65)	-1.22* (0.73)	-1.26 (1.03)	-1.90** (0.92)
Drinks and Tobacco	ln(total expenditure)	1.75 (1.14)	1.34 (1.09)	3.12 (2.03)	2.60 (1.66)
	▽ Homicide rate last 12 months	0.20 (0.16)	0.23 (0.22)	0.18 (0.19)	0.14 (0.22)
Male clothing	ln(total expenditure)	1.00 (0.62)	1.04* (0.62)	0.90 (0.82)	0.96 (0.72)
	▽ Homicide rate last 12 months	0.21* (0.12)	0.25* (0.14)	0.29* (0.15)	0.29* (0.16)
Female clothing	ln(total expenditure)	0.82 (0.69)	0.66 (0.72)	0.84 (0.98)	0.68 (0.90)
	▽ Homicide rate last 12 months	0.06 (0.10)	0.11 (0.11)	0.10 (0.14)	0.19 (0.16)
Children goods	ln(total expenditure)	-0.30 (1.00)	-0.55 (0.96)	-0.27 (1.45)	-1.02 (1.42)
	▽ Homicide rate last 12 months	-0.24 (0.17)	-0.18 (0.18)	-0.27 (0.24)	-0.24 (0.25)
Hygiene and care	ln(total expenditure)	-2.02 (1.68)	-1.51 (1.65)	-1.18 (2.40)	-0.56 (2.30)
	▽ Homicide rate last 12 months	-0.70*** (0.25)	-0.43* (0.23)	-0.54* (0.31)	-0.39 (0.28)
Other hh goods	ln(total expenditure)	2.15 (2.79)	1.31 (2.94)	6.17 (4.33)	4.99 (4.16)
	▽ Homicide rate last 12 months	0.07 (0.44)	0.09 (0.50)	0.61 (0.50)	0.43 (0.48)
Transportation	ln(total expenditure)	10.16*** (2.80)	9.06*** (2.76)	8.81* (5.03)	7.72* (4.48)
	▽ Homicide rate last 12 months	0.51 (0.48)	0.76 (0.49)	-0.10 (0.53)	0.65 (0.63)
Health	ln(total expenditure)	0.54 (1.33)	0.40 (1.28)	2.91* (1.67)	2.56 (1.57)
	▽ Homicide rate last 12 months	0.26 (0.27)	0.38 (0.27)	0.26 (0.36)	0.32 (0.33)
Education	ln(total expenditure)	-0.06 (0.83)	-0.36 (0.84)	-0.30 (1.21)	-0.57 (1.32)
	▽ Homicide rate last 12 months	0.19 (0.14)	0.15 (0.15)	0.14 (0.21)	0.10 (0.22)
Recreation	ln(total expenditure)	5.17*** (1.47)	4.97*** (1.51)	5.50* (2.98)	4.87* (2.69)
	▽ Homicide rate last 12 months	0.36 (0.27)	0.05 (0.25)	0.56 (0.36)	0.50 (0.32)
Gambling	ln(total expenditure)	0.16 (0.17)	0.20 (0.15)	0.15 (0.28)	0.24 (0.22)
	▽ Homicide rate last 12 months	0.03 (0.02)	0.04 (0.03)	0.02 (0.03)	0.05 (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 A14: Familywise Error Rate p-values

	(1)	(2)	(3)	(4)
	All households		Nuclear with children	
	$\sqrt[4]{\text{Homicide}}$	FWER p-value	$\sqrt[4]{\text{Homicide}}$	FWER p-value
	rate last 12 months		rate last 12 months	
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*** (1.46)	-16.89*** (1.75)
	↙ Homicide rate last 12 months	-0.87* (0.52)	-1.22** (0.60)
	p-value Mundlak effects	0.06	0.42
Drinks and Tobacco	ln(total expenditure)	-0.18 (0.37)	-0.17 (0.44)
	↙ Homicide rate last 12 months	0.02 (0.14)	-0.03 (0.13)
	p-value Mundlak effects	0.00	0.30
Male clothing	ln(total expenditure)	0.86*** (0.21)	0.92*** (0.26)
	↙ Homicide rate last 12 months	0.20*** (0.07)	0.23*** (0.09)
	p-value Mundlak effects	0.13	0.26
Female clothing	ln(total expenditure)	0.64*** (0.23)	0.80*** (0.30)
	↙ Homicide rate last 12 months	0.04 (0.07)	0.05 (0.10)
	p-value Mundlak effects	0.11	0.01
Children goods	ln(total expenditure)	0.20 (0.26)	0.35 (0.35)
	↙ Homicide rate last 12 months	-0.07 (0.15)	-0.11 (0.19)
	p-value Mundlak effects	0.00	0.00
Hygiene and care	ln(total expenditure)	-1.32*** (0.42)	-1.39*** (0.50)
	↙ Homicide rate last 12 months	-0.44*** (0.17)	-0.37* (0.20)
	p-value Mundlak effects	0.15	0.13
Other hh goods	ln(total expenditure)	2.63** (1.03)	2.78** (1.13)
	↙ Homicide rate last 12 months	0.18 (0.32)	0.51 (0.33)
	p-value Mundlak effects	0.34	0.08
Transportation	ln(total expenditure)	10.24*** (1.07)	9.90*** (1.32)
	↙ Homicide rate last 12 months	0.55* (0.32)	0.36 (0.39)
	p-value Mundlak effects	0.37	0.01
Health	ln(total expenditure)	2.27*** (0.42)	1.95*** (0.46)
	↙ Homicide rate last 12 months	0.20 (0.17)	0.15 (0.22)
	p-value Mundlak effects	0.02	0.19
Education	ln(total expenditure)	-0.01 (0.28)	-0.14 (0.40)
	↙ Homicide rate last 12 months	0.06 (0.10)	0.07 (0.14)
	p-value Mundlak effects	0.00	0.00
Recreation	ln(total expenditure)	2.25*** (0.39)	1.87*** (0.52)
	↙ Homicide rate last 12 months	0.11 (0.17)	0.34 (0.22)
	p-value Mundlak effects	0.00	0.00
Gambling	ln(total expenditure)	0.02 (0.04)	0.02 (0.05)
	↙ Homicide rate last 12 months	0.02* (0.01)	0.02 (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 A17: Effect of Homicide Rates on Budget Shares: Transformations of Homicide Rates

	(1)	(2)	(3)	(4)	(5)
	$\sqrt{Hom. rate}$	$\log(Hom. rate)$	IHS ($Hom. rate$)	$Hom. rate$	$\sqrt{Hom. rate last 2 years}$
Food	-1.07*** (0.38)	-0.68*** (0.26)	-0.34*** (0.13)	-0.05*** (0.01)	-0.83** (0.42)
Drinks and Tob.	0.05 (0.10)	0.05 (0.07)	0.03 (0.04)	0.00 (0.00)	0.15 (0.12)
Male clothing	0.21*** (0.07)	0.15*** (0.05)	0.07*** (0.02)	0.01* (0.00)	0.14* (0.08)
Female clothing	0.06 (0.08)	0.05 (0.05)	0.02 (0.03)	0.00 (0.00)	0.06 (0.09)
Children goods	-0.07 (0.10)	-0.07 (0.06)	-0.03 (0.03)	-0.00 (0.00)	-0.01 (0.09)
Hygiene and care	-0.43*** (0.14)	-0.32*** (0.09)	-0.16*** (0.05)	-0.01* (0.00)	-0.32** (0.14)
Other hh goods	0.20 (0.25)	0.15 (0.17)	0.07 (0.08)	0.02** (0.01)	0.28 (0.26)
Transportation	0.58** (0.28)	0.33* (0.19)	0.17* (0.09)	0.02* (0.01)	0.04 (0.29)
Health	0.26* (0.15)	0.19* (0.10)	0.10* (0.05)	0.01 (0.01)	0.39** (0.18)
Education	0.06 (0.09)	0.04 (0.06)	0.02 (0.03)	0.00 (0.00)	-0.07 (0.10)
Recreation	0.13 (0.14)	0.09 (0.09)	0.04 (0.05)	0.01* (0.00)	0.14 (0.13)
Gambling	0.02** (0.01)	0.02* (0.01)	0.01* (0.00)	0.00 (0.00)	0.02 (0.01)

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table A17 reports the different coefficient γ^k on the several transformations of the homicide rate in 100,000 of each equation (12). 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 A16: Effect of Homicide Rates on Expenditure Shares: Removing Expenditure Restrictions

	(1)
Food	-0.89* (0.50)
Drinks and Tob.	0.09 (0.13)
Male clothing	0.23*** (0.06)
Female clothing	0.05 (0.06)
Children goods	-0.08 (0.12)
Hygiene and care	-0.40** (0.16)
Other hh goods	0.21 (0.26)
Transportation	0.39 (0.28)
Health	0.20 (0.14)
Education	0.08 (0.08)
Recreation	0.06 (0.18)
Gambling	0.05* (0.03)
	✓
	✓
	✓
	4,415

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table A16 reports coefficient γ^k on the quartic of the homicide rate in 100,000 of each equation (12). 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 A18: Impacts of Homicide Rates on Budget Shares: QUAIDS

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(exp)	All households ln(exp) ²	∜ Hom. rate	ln(exp)	Nuclear with children ln(exp) ²	∜ Hom. rate
Food	3.23 (10.65)	-0.87* (0.47)	-1.10** (0.47)	3.55 (13.58)	-1.00* (0.60)	-1.36** (0.59)
Drinks and Tobacco	2.02 (2.47)	-0.11 (0.11)	0.06 (0.14)	3.69 (2.76)	-0.16 (0.12)	0.01 (0.13)
Male clothing	2.94* (1.65)	-0.04 (0.08)	0.24*** (0.08)	1.15 (1.82)	0.01 (0.08)	0.25*** (0.09)
Female clothing	-1.82 (1.66)	0.13* (0.07)	0.06 (0.07)	-3.67* (1.91)	0.20** (0.09)	0.06 (0.10)
Children goods	0.33 (2.16)	0.01 (0.10)	-0.07 (0.14)	0.54 (2.89)	0.02 (0.14)	-0.11 (0.19)
Hygiene and care	6.04 (3.90)	-0.30* (0.18)	-0.42** (0.17)	8.38* (4.39)	-0.39** (0.20)	-0.36* (0.19)
Other hh goods	-0.17 (7.89)	0.09 (0.35)	0.20 (0.31)	1.60 (8.61)	0.10 (0.39)	0.56* (0.34)
Transportation	5.39 (6.56)	0.06 (0.30)	0.58* (0.30)	4.93 (8.49)	0.02 (0.38)	0.35 (0.38)
Health	-1.93 (3.48)	0.15 (0.16)	0.24 (0.15)	-1.48 (3.52)	0.18 (0.17)	0.21 (0.21)
Education	-2.27 (2.47)	0.11 (0.11)	0.07 (0.08)	-5.46 (3.46)	0.26* (0.16)	0.07 (0.13)
Recreation	-11.85*** (3.80)	0.69*** (0.17)	0.13 (0.19)	-10.75** (5.22)	0.65*** (0.23)	0.31 (0.23)
Gambling	-1.91 (1.43)	0.09 (0.06)	0.02 (0.01)	-2.49 (2.10)	0.12 (0.09)	0.02 (0.02)
F (instruments)	62.69			33.80		
Joint test $\ln(x)^2 : \chi^2$	34.48			26.32		
Joint test $\ln(x)^2 : p\text{-value}$	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 A19: Impacts of Homicide Rates on Budget Shares: QUAIDS Control for Unobserved Prices

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(exp)	All households ln(exp) ²	↙ Hom. rate	ln(exp)	Nuclear with children ln(exp) ²	↙ Hom. rate
Food	-1.11 (17.66)	-0.76 (0.77)	-0.95* (0.52)	-2.59 (23.07)	-0.84 (0.99)	-1.63** (0.75)
Drinks and Tobacco	6.31 (4.03)	-0.30* (0.18)	-0.11 (0.16)	8.32** (4.07)	-0.36** (0.17)	-0.09 (0.15)
Male clothing	2.98 (2.74)	-0.02 (0.13)	0.26*** (0.09)	0.87 (3.54)	0.03 (0.16)	0.29*** (0.11)
Female clothing	-3.18 (2.82)	0.20 (0.13)	0.07 (0.10)	-3.48 (3.75)	0.17 (0.17)	0.11 (0.13)
Children goods	1.80 (2.93)	-0.06 (0.14)	0.06 (0.16)	0.55 (4.09)	0.05 (0.18)	0.07 (0.23)
Hygiene and care	8.75 (5.37)	-0.43* (0.25)	-0.34* (0.20)	14.28** (6.68)	-0.69** (0.31)	-0.21 (0.24)
Other hh goods	-10.96 (11.78)	0.53 (0.53)	-0.22 (0.40)	-8.84 (13.00)	0.58 (0.57)	0.26 (0.47)
Transportation	5.06 (11.09)	0.13 (0.51)	0.81** (0.34)	1.39 (13.63)	0.26 (0.63)	0.53 (0.47)
Health	7.06 (6.62)	-0.30 (0.29)	0.27 (0.23)	6.86 (6.99)	-0.21 (0.33)	0.23 (0.27)
Education	1.25 (3.77)	-0.03 (0.16)	0.12 (0.12)	-2.15 (4.62)	0.13 (0.21)	0.14 (0.16)
Recreation	-17.28*** (5.69)	1.00*** (0.26)	0.03 (0.21)	-14.38* (7.76)	0.84** (0.33)	0.28 (0.28)
Gambling	-0.68 (0.70)	0.04 (0.03)	0.02 (0.02)	-0.82 (1.17)	0.04 (0.05)	0.01 (0.03)
F (instruments)	38.30			22.34		
Joint test $\ln(x)^2 : \chi^2$	30.79			18.46		
Joint test $\ln(x)^2 : p\text{-value}$	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 A20: Effects of Homicide Rates on Budget Shares: Purchased versus Home production/gifts

		(1) All households Purchased	(2) HP/Gifts	(3) Nuclear with children Purchased	(4) HP/Gifts
Food	ln(total expenditure)	-12.52*** (3.95)	2.35 (1.51)	-17.84*** (5.55)	2.72 (1.94)
	▽ Homicide rate last 12 months	-0.91 (0.55)	0.09 (0.24)	-1.01 (0.65)	-0.13 (0.14)
Drinks and Tobacco	ln(total expenditure)	-0.27 (0.89)	0.12 (0.16)	0.55 (1.33)	0.06 (0.10)
	▽ Homicide rate last 12 months	0.06 (0.14)	-0.00 (0.01)	0.03 (0.13)	-0.01 (0.01)
Male clothing	ln(total expenditure)	1.65*** (0.56)	0.28 (0.18)	1.27** (0.62)	-0.05 (0.06)
	▽ Homicide rate last 12 months	0.21*** (0.07)	0.02 (0.02)	0.24*** (0.09)	0.00 (0.01)
Female clothing	ln(total expenditure)	1.18* (0.69)	0.15 (0.24)	0.95 (1.06)	-0.09 (0.09)
	▽ Homicide rate last 12 months	0.05 (0.07)	0.01 (0.02)	0.07 (0.09)	-0.01 (0.01)
Children goods	ln(total expenditure)	1.31* (0.72)	-0.13 (0.15)	2.15* (1.23)	-0.11 (0.23)
	▽ Homicide rate last 12 months	-0.01 (0.13)	-0.05** (0.02)	-0.04 (0.17)	-0.06* (0.04)
Hygiene and care	ln(total expenditure)	-1.57 (1.27)		-0.97 (1.77)	
	▽ Homicide rate last 12 months	-0.45** (0.17)		-0.38* (0.20)	
Other hh goods	ln(total expenditure)	1.24 (2.45)		4.85 (3.34)	
	▽ Homicide rate last 12 months	0.20 (0.31)		0.58* (0.35)	
Transportation	ln(total expenditure)	8.27*** (2.28)	0.40 (1.20)	7.83** (3.72)	0.19 (1.83)
	▽ Homicide rate last 12 months	0.60** (0.29)	0.25 (0.17)	0.38 (0.37)	0.09 (0.25)
Health	ln(total expenditure)	0.83 (0.94)	-0.02 (0.10)	2.14* (1.17)	-0.09 (0.17)
	▽ Homicide rate last 12 months	0.23 (0.16)	0.01 (0.01)	0.21 (0.21)	-0.00 (0.01)
Education	ln(total expenditure)	0.48 (0.70)		0.34 (1.22)	
	▽ Homicide rate last 12 months	0.08 (0.09)		0.08 (0.13)	
Recreation	ln(total expenditure)	2.80** (1.26)		2.22 (2.07)	
	▽ Homicide rate last 12 months	0.10 (0.15)		0.23 (0.19)	
Gambling	ln(total expenditure)	0.12 (0.10)		0.10 (0.20)	
	▽ Homicide rate last 12 months	0.02* (0.01)		0.02 (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 A21: Effect of Homicide Rates on Wealth, Earnings, and Informal Jobs

	ln(Wealth) (1)	✓ Total earnings last year (2)	Number oral contracts (3)	Someone oral contract (4)
✓ Homicide rate last 12 months	-0.112 (0.123)	0.059 (0.298)	0.032 (0.029)	0.023 (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 A22: Effect of Homicide Rates on Expenditure Shares: Households with Same Respondent Across Survey Waves

	(1)
Food	-0.92* (0.55)
Drinks and Tobacco	0.03 (0.16)
Male adult clothing	0.26*** (0.07)
Female adult clothing	0.09 (0.07)
Children goods	-0.09 (0.14)
Hygiene and care	-0.40** (0.18)
Other hh goods	0.44 (0.29)
Transportation	0.35 (0.30)
Health	0.04 (0.14)
Education	-0.01 (0.09)
Recreation	0.20 (0.18)
Gambling	0.02 (0.01)
Household controls	✓
Month and year of interview FE	✓
Household FE	✓
Observations	6,420

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Table A22 limits the sample to those households who had the same respondent on the consumption module in MxFLS-2 and MxFLS-3. It reports coefficient γ^k on the quartic of the homicide rate in 100,000 of each equation (12)

Table A23: Effect of homicides on who is present at the time of the interview

	Wife responds, nobody present (1)	Wife responds, spouse present (2)	Husband responds, nobody present (3)	Husband responds, spouse present (4)
✓ Homicide rate last 12 months	-0.018 (0.021)	-0.004 (0.012)	0.008 (0.008)	0.001 (0.005)
Intercept	1.701*** (0.336)	-0.069 (0.202)	0.048 (0.185)	0.133 (0.118)
Household controls	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Year of interview FE	✓	✓	✓	✓
Month of interview FE	✓	✓	✓	✓
Outcome mean	0.51	0.11	0.06	0.02
Observations	8,488	8,488	8,488	8,488
adj. R^2	0.10	0.03	0.08	0.05

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

Table A24: Effects of Homicide Rates on Market Prices

	Food	HH goods	Men clothes	Women clothes	Child clothes
✓ Hom. last 12 months	-0.03* (0.02)	-0.07 (0.05)	-0.05 (0.03)	-0.07 (0.04)	-0.01 (0.04)
Intercept	0.43*** (0.02)	0.12*** (0.04)	0.15*** (0.04)	0.13*** (0.04)	0.12*** (0.04)
State-Survey FE					
Observations	120	120	120	120	120
✓ Hom. last 12 months	-0.01 (0.03)	-0.03 (0.05)	-0.03 (0.03)	-0.07 (0.05)	0.05 (0.03)
Intercept	0.43*** (0.03)	0.06 (0.10)	0.07 (0.10)	-0.03 (0.06)	0.11 (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 A25: Effect of homicides on fear of victimization

	Women				Men			
	Scared attacked day (1)	Scared attacked night (2)	Feels safer (3)	Expect attack (4)	Scared attacked day (5)	Scared attacked night (6)	Feels safer (7)	Expect attack (8)
✓ Homicide rate last 12 months	0.054 (0.035)	0.083** (0.039)	-0.075*** (0.027)	0.115** (0.053)	0.049 (0.036)	0.028 (0.035)	-0.044* (0.025)	0.050 (0.047)
Intercept	2.459*** (0.558)	1.694*** (0.591)	1.161*** (0.402)	2.111*** (0.711)	1.934*** (0.477)	2.013*** (0.469)	0.976*** (0.363)	2.545*** (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 A26: Effect of homicides on household composition

	Number Female					Number Male					HHsize	Log(hhszie)
	0-6 (1)	7-11 (2)	12-18 (3)	18-55 (4)	+55 (5)	0-6 (6)	7-11 (7)	12-18 (8)	18-55 (9)	+55 (10)	HHsize (11)	Log(hhszie) (12)
✓' Homicide rate last 12 months	-0.006 (0.011)	0.020 (0.016)	-0.021 (0.015)	-0.013 (0.014)	0.003 (0.007)	0.009 (0.011)	-0.028* (0.015)	0.009 (0.014)	0.003 (0.014)	-0.005 (0.006)	-0.014 (0.023)	-0.003 (0.004)
Intercept	-1.401*** (0.148)	1.023*** (0.171)	1.650*** (0.184)	3.583*** (0.169)	-0.849** (0.085)	-1.199*** (0.144)	0.854*** (0.147)	2.028*** (0.163)	2.638*** (0.170)	-0.613*** (0.073)	7.711*** (0.306)	2.171*** (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 A27: Effect of homicides on who is present at the time of the interview

	Wife responds, nobody present (1)	Wife responds, spouse present (2)	Husband responds, nobody present (3)	Husband responds, spouse present (4)
✓' Homicide rate last 12 months	-0.018 (0.021)	-0.004 (0.012)	0.008 (0.008)	0.001 (0.005)
Intercept	1.701*** (0.336)	-0.069 (0.202)	0.048 (0.185)	0.133 (0.118)
Household controls	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Year of interview FE	✓	✓	✓	✓
Month of interview FE	✓	✓	✓	✓
Outcome mean	0.51	0.11	0.06	0.02
Observations	8,488	8,488	8,488	8,488
adj. R^2	0.10	0.03	0.08	0.05

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

Table A28: 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\sqrt[4]{}$ Homicide rate last 12 months	-0.017 (0.012)	-0.012 (0.017)	-0.008 (0.011)	-0.025 (0.084)	-0.001 (0.142)	0.054 (0.065)	-0.021 (0.098)
Intercept	1.748*** (0.232)	4.090*** (0.402)	2.503*** (0.254)	14.679*** (1.542)	30.518*** (3.104)	17.543*** (1.735)	9.171*** (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 household in the last 12 months.

Table A29: Effect of homicides on Time Spent Outside

	Women			Men			
	Extensive margin (1)	# Hours (2)	Quartic root hours (3)	Extensive margin (4)	# Hours (5)	Quartic root hours (6)	
$\sqrt[4]{}$ Homicide rate last 12 months	-0.017** (0.007)	-0.071 (0.053)	-0.023** (0.010)	-0.002 (0.011)	0.053 (0.086)	0.001 (0.017)	
Intercept	0.137 (0.108)	0.463 (1.204)	0.208 (0.171)	0.210 (0.170)	-0.647 (1.552)	0.238 (0.244)	
Household controls	✓	✓	✓	✓	✓	✓	✓
Household FE	✓	✓	✓	✓	✓	✓	✓
Month and year of interview FE	✓	✓	✓	✓	✓	✓	✓
Observations	7,960	7,958	7,958	6,246	6,238	6,238	
adj. R^2	0.09	0.05	0.10	0.23	0.07	0.21	

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

Table A30: 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 (0.010)	0.013* (0.008)	0.007 (0.015)	0.010 (0.010)
Wife's clothes	-0.012 (0.011)	0.017** (0.008)	-0.019 (0.012)	0.018* (0.010)
Husband's spouses' clothes	-0.010 (0.011)	-0.002 (0.012)	-0.013 (0.010)	-0.013 (0.013)
Large expenditures for the house	0.012 (0.021)	0.012 (0.014)	-0.001 (0.010)	-0.004 (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 husband reports not been the decision maker but his wife disagrees.

Table A31: Effect of homicides on female alcohol and tobacco habits

	(1) Likes to drink alcohol at social gathering	(2) Drink alcohol with food at home	(3) Ever smoked cigarettes	(4) $\sqrt{\text{money/week}}$ cigarettes	(5) $\sqrt{\text{number cigarettes / week}}$
$\sqrt{\cdot}$ Homicide rate last 12 months	-0.019** (0.009)	0.009 (0.013)	0.005 (0.006)	0.004 (0.009)	0.009 (0.008)
Intercept	0.337** (0.168)	0.122 (0.152)	0.110 (0.103)	0.483*** (0.163)	0.454*** (0.143)
Household controls	✓	✓	✓	✓	✓
Household FE	✓	✓	✓	✓	✓
Year of interview FE	✓	✓	✓	✓	✓
Month of interview FE	✓	✓	✓	✓	✓
Outcome mean	0.15	0.05	0.06	0.09	0.08
Observations	7,888	7,896	7,932	7,910	7,928
adj. R^2	0.31	0.10	0.48	0.58	0.58

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

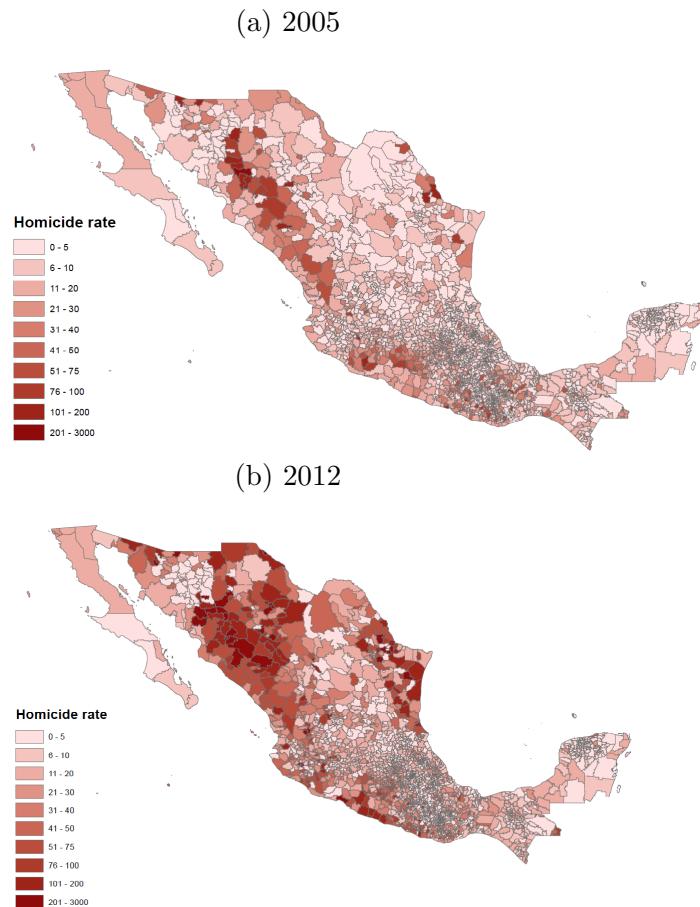
Table A32: Effect of homicides on male alcohol and tobacco habits

	(1)	(2)	(3)	(4)	(5)
	Likes to drink alcohol at social gathering	Drink alcohol with food at home	Ever smoked cigarettes	$\sqrt{\text{money/week}}$ cigarettes	$\sqrt{\text{number cigarettes / week}}$
$\sqrt{\text{Homicide rate last 12 months}}$	-0.011 (0.014)	0.020 (0.015)	0.011 (0.013)	-0.021 (0.022)	-0.025 (0.020)
Intercept	0.331 (0.279)	-0.337* (0.181)	0.448** (0.198)	0.948** (0.419)	0.984** (0.382)
Household controls	✓	✓	✓	✓	✓
Household FE	✓	✓	✓	✓	✓
Year of interview FE	✓	✓	✓	✓	✓
Month of interview FE	✓	✓	✓	✓	✓
Outcome mean	0.56	0.08	0.25	0.45	0.41
Observations	6,234	6,206	6,250	6,200	6,242
adj. R^2	0.33	0.15	0.41	0.53	0.54

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

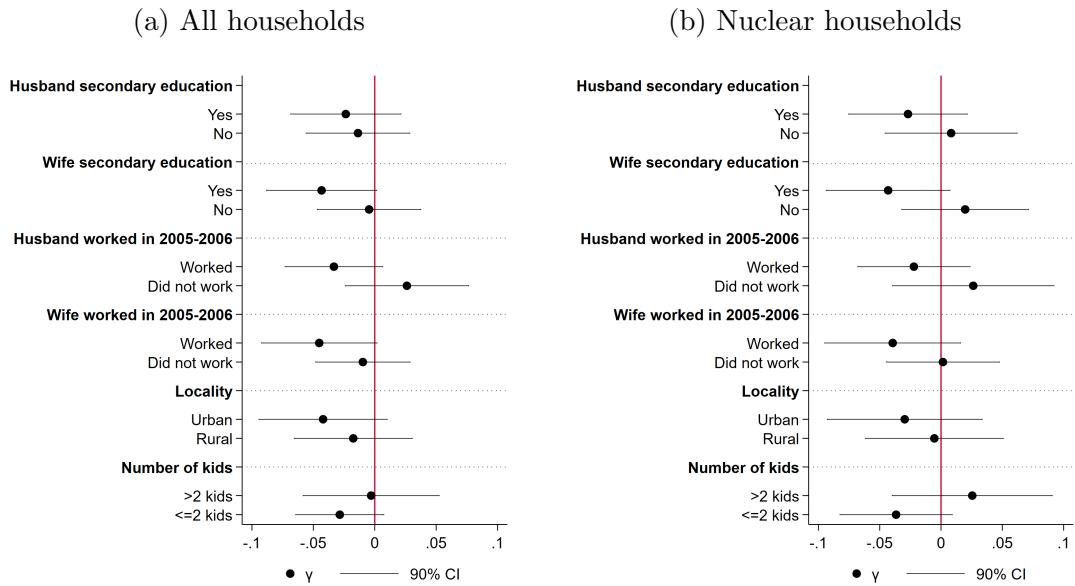
A.2 Appendix Figures

Figure A1: Annual Homicide Rates at the Municipality Level (per 100,000 People)



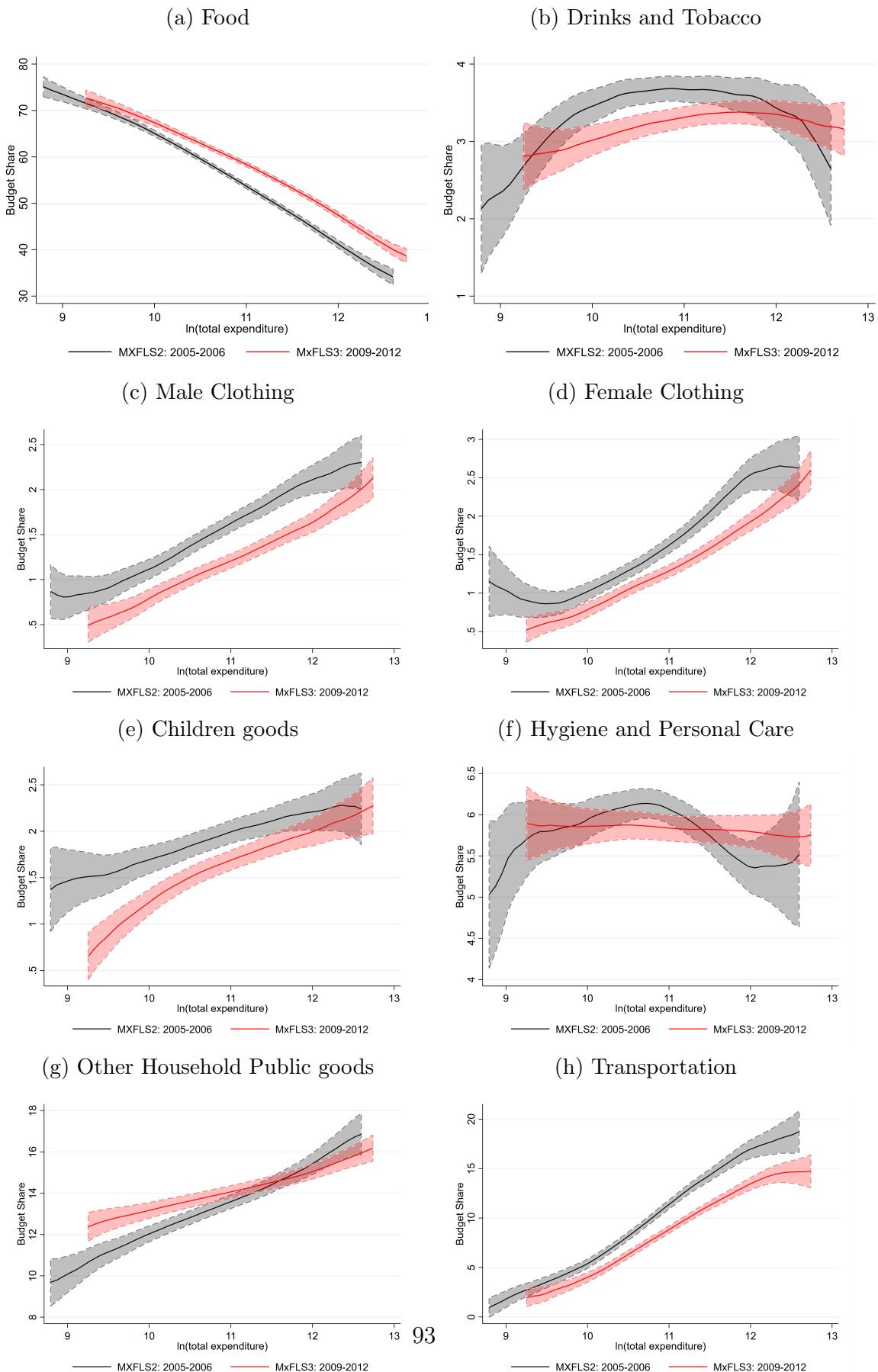
Notes: Annual homicide rates at the municipality level (per 100,000) in 2005 and 2012.

Figure A2: Heterogeneous Effects of Homicide Rates on Total Household Expenditure

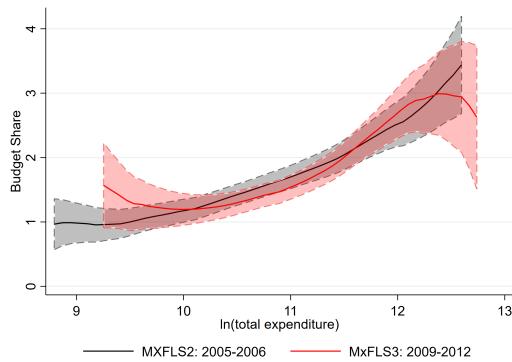


Notes: Figure A2 plots marginal effects of increases in homicides on the log of total household expenditure. Each coefficient is estimated in a separate regression in which the sample is restricted to the categories reported in the left columns. Standard errors are clustered at the municipality level. Confidence intervals are constructed with a 90% significance level.

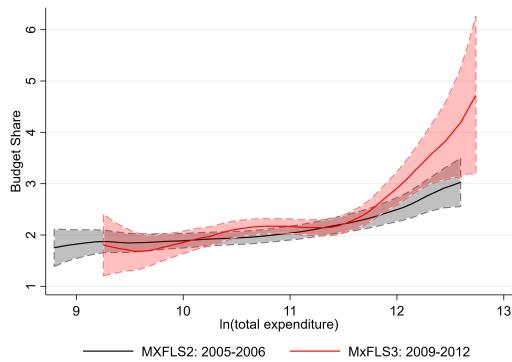
Figure A3: Non-Parametric Engel Curves



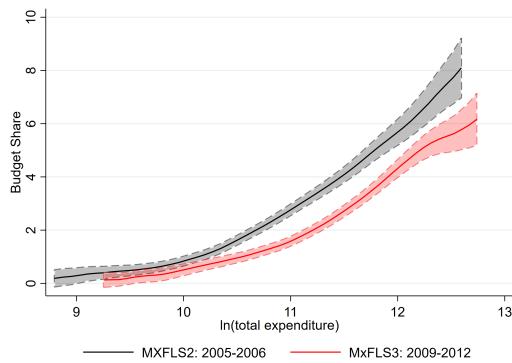
(i) Health



(j) Education



(k) Recreation



(l) Gambling

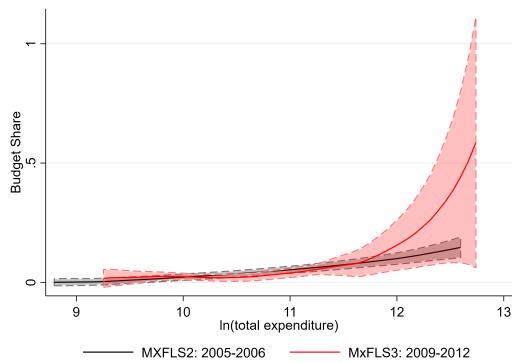
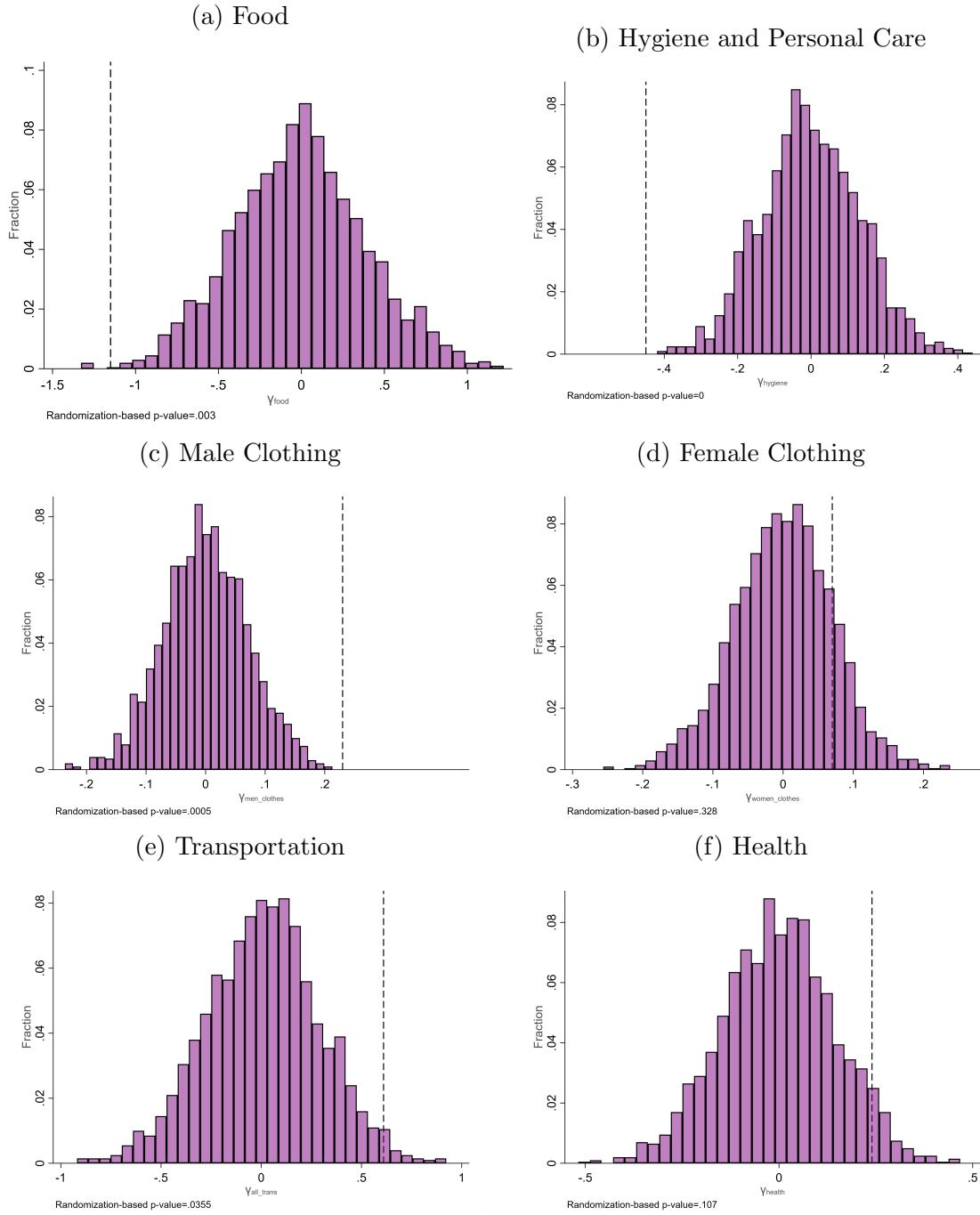


Figure A5: Randomization Inference of Homicide Rate's Effects on Budget Shares



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 reassessments come from the original distribution of homicide rates of the analytical sample. The black dashed line represents actual estimates from the main specification.

Figure A6: Budget Shares vs. Resource Shares

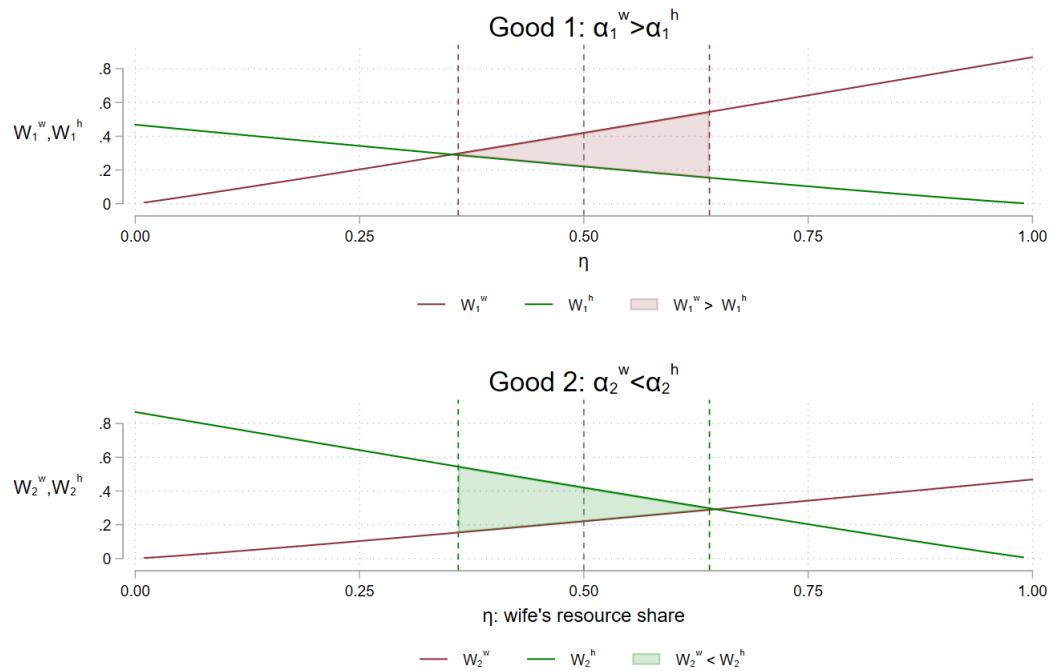
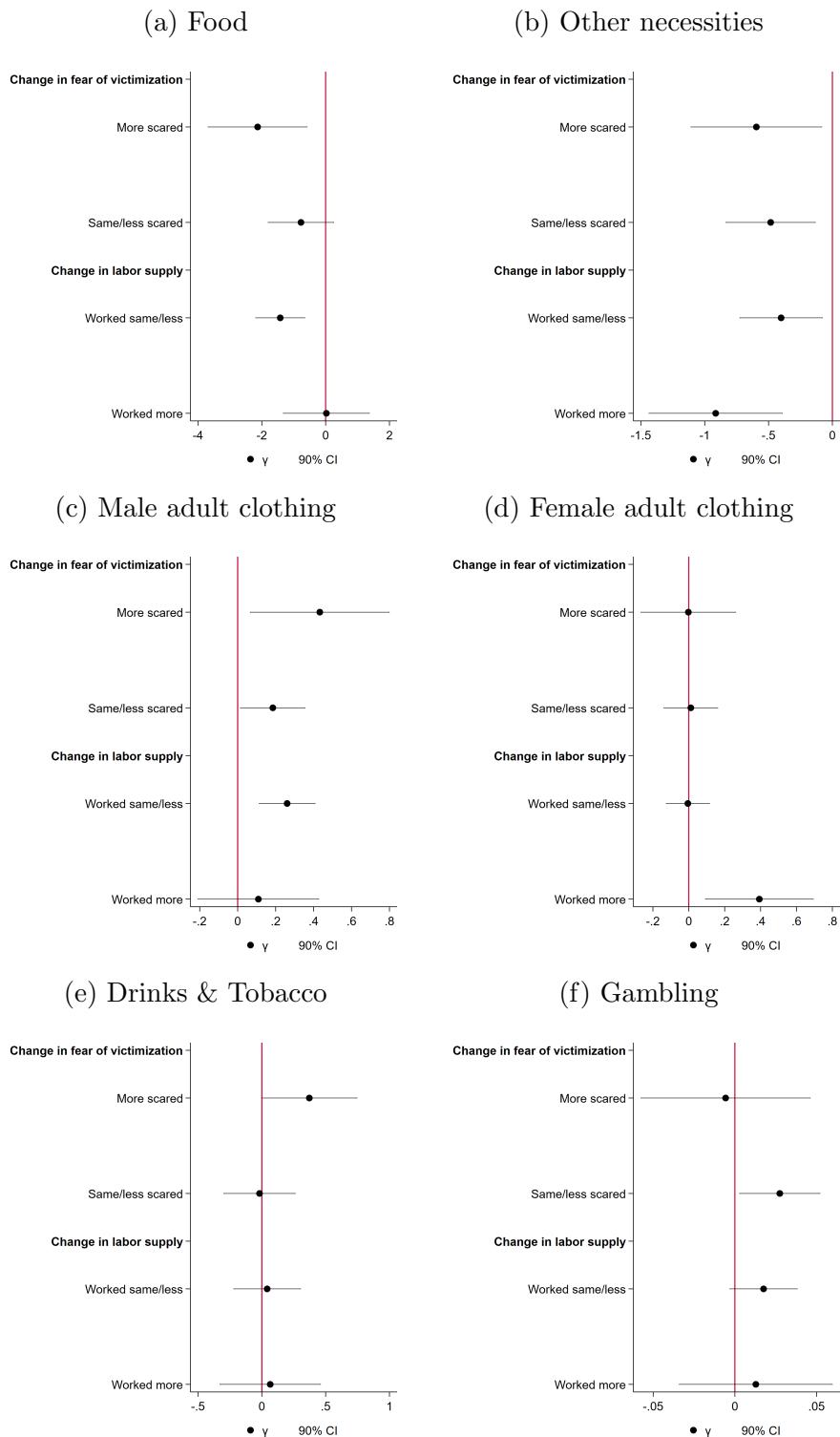
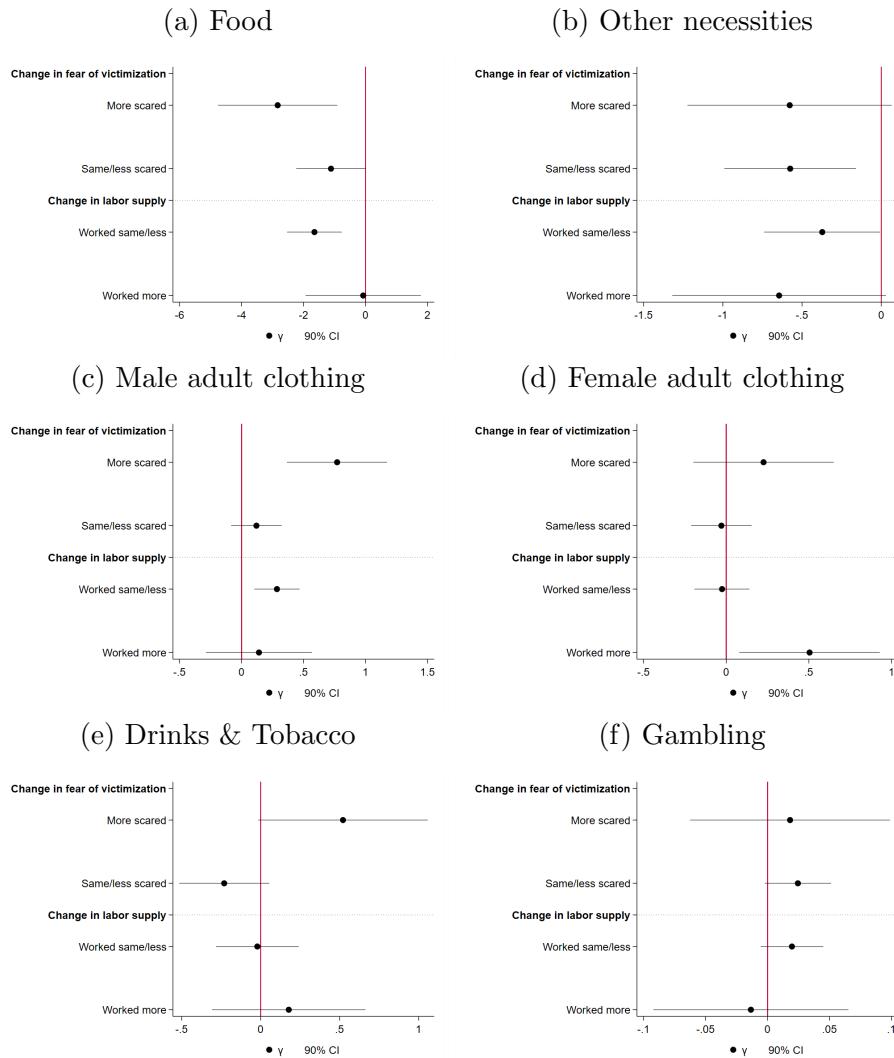


Figure A7: Heterogeneous Effects of Homicide Rates on Expenditure Shares



Notes: Figure A7 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.

Figure A8: Heterogeneous Effects of Homicide Rates on Expenditure Shares: Nuclear Households



Notes: Figure A7 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.

A.3 Attrition Analysis

Table A33 presents an analysis of the probability of attrition based on the following probit regression specification:

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

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 is heterogeneity in selective attrition based on households’ baseline attributes. The results are qualitatively equivalent using a linear probability model and are available upon request.

Table A33: Prediction of Attrition

	All households			Nuclear with children		
$\Delta \sqrt[4]{H_{-j}}$	-0.020 (0.023)	-0.013 (0.047)	0.063 (0.199)	0.004 (0.030)	-0.006 (0.047)	-0.096 (0.215)
$\Delta \sqrt[4]{H_{-j}} * \text{age wife}$			0.003 (0.006)			0.002 (0.009)
$\Delta \sqrt[4]{H_{-j}} * \text{age husb}$			-0.000 (0.005)			0.000 (0.006)
$\Delta \sqrt[4]{H_{-j}} * \text{secondary wife}$			-0.077 (0.063)			-0.070 (0.067)
$\Delta \sqrt[4]{H_{-j}} * \text{secondary husb}$			0.097 (0.064)			0.077 (0.069)
$\Delta \sqrt[4]{H_{-j}} * \# \text{kids}$			0.004 (0.028)			-0.023 (0.019)
$\Delta \sqrt[4]{H_{-j}} * \text{children average age}$			0.005 (0.005)			0.005 (0.007)
$\Delta \sqrt[4]{H_{-j}} * \text{rural}$			-0.017 (0.056)			-0.029 (0.063)
$\Delta \sqrt[4]{H_{-j}} * \log(\text{hhszie})$			-0.162 (0.109)			
Intercept	-0.680*** (0.029)	-1.148*** (0.294)	-1.180*** (0.298)	-0.770*** (0.034)	-1.112*** (0.313)	-1.065*** (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.

Table A34: Prediction of Consumption Module Missing in MxFLS-3

$\Delta \sqrt[4]{H_{-j}}$	-0.040 (0.039)	0.059 (0.056)	0.218 (0.316)
$\Delta \sqrt[4]{H_{-j}} * \text{age wife}$			-0.009 (0.010)
$\Delta \sqrt[4]{H_{-j}} * \text{age husb}$			0.006 (0.007)
$\Delta \sqrt[4]{H_{-j}} * \text{secondary wife}$			-0.078 (0.088)
$\Delta \sqrt[4]{H_{-j}} * \text{secondary husb}$			0.120 (0.082)
$\Delta \sqrt[4]{H_{-j}} * \# \text{ kids}$			-0.019 (0.058)
$\Delta \sqrt[4]{H_{-j}} * \text{children average age}$			0.005 (0.007)
$\Delta \sqrt[4]{H_{-j}} * \log (\text{hhsiz})$			-0.130 (0.218)
$\Delta \sqrt[4]{H_{-j}} * \text{rural}$			0.091 (0.084)
Intercept	-1.191*** (0.045)	-0.959*** (0.299)	-1.054*** (0.320)
Household controls		✓	✓
State FE		✓	✓
N	5,637	4,838	4,838
Mean dependent variable	0.11	0.11	0.11
adj. R^2			
χ^2 interactions jointly=0 (p-value)			0.18

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 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 wave 2 had consumption module missing in MxFLS wave 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, $\log(\text{household size})$, and year and month of interview fixed effects.

Table A35: Prediction of Not Married in MxFLS-3

	Women			Men		
	Not married	Widow	Divorced	Not married	Widow	Divorced
$\Delta \sqrt[4]{H_j}$	0.055 (0.040)	0.160** (0.075)	-0.116 (0.127)	0.032 (0.040)	0.079 (0.090)	-0.160 (0.108)
Household controls	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
N	4,464	4,046	4,239	4,458	4,061	4,351
Mean dependent variable	0.18	0.01	0.01	0.20	0.01	0.01
adj. R^2						
χ^2 interactions jointly=0 (p-value)						

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. 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 wave 2 had consumption module missing in MxFLS wave 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 A36 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. π_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 A36: Prediction of Migration

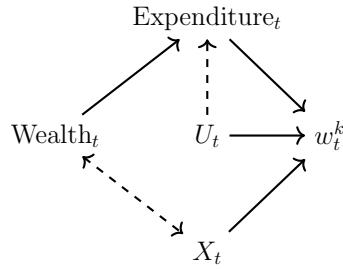
	All households			Nuclear with children		
$\Delta \sqrt[4]{H_j}$	-0.039 (0.095)	0.067 (0.087)	-0.235 (0.351)	-0.039 (0.100)	0.084 (0.091)	-0.345 (0.304)
$\Delta \sqrt[4]{H_j} * \text{age wife}$			0.007 (0.015)			0.001 (0.017)
$\Delta \sqrt[4]{H_j} * \text{age husb}$			-0.009 (0.012)			-0.005 (0.014)
$\Delta \sqrt[4]{H_j} * \text{secondary wife}$			0.021 (0.123)			0.023 (0.132)
$\Delta \sqrt[4]{H_j} * \text{secondary husb}$			0.290** (0.130)			0.309** (0.137)
$\Delta \sqrt[4]{H_j} * \# \text{kids}$			0.016 (0.044)			-0.005 (0.042)
$\Delta \sqrt[4]{H_j} * \text{children average age}$			0.009 (0.013)			0.023 (0.016)
$\Delta \sqrt[4]{H_j} * \text{rural}$			0.252 (0.186)			0.363** (0.172)
$\Delta \sqrt[4]{H_j} * \log (\text{hhsiz})$			-0.022 (0.192)			
Intercept	-1.836*** (0.122)	-1.651*** (0.597)	-1.631*** (0.611)	-1.776*** (0.121)	-0.458 (0.518)	-0.207 (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 if 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 A9 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 A9: 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, AFORRES, coins and others, trac-

tor/other machinery or equipment, livestock (cows, bulls, horses, pigs, chickens, etc.), other assets.

Table A37: First Stage Regression for Total Expenditure

	ln(total expenditure)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Wealth instrument)	0.074*** (0.004)	0.054*** (0.003)	0.026*** (0.004)	-0.105*** (0.012)	-0.085*** (0.009)	-0.025** (0.010)
ln(Wealth instrument) ²				0.012*** (0.001)	0.009*** (0.001)	0.004*** (0.001)
age wife	0.002 (0.005)				-0.003 (0.005)	
age husb	0.016*** (0.006)				0.012** (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*** (0.019)				0.226*** (0.018)	
secondary_husb	0.225*** (0.021)				0.199*** (0.020)	
log(household size)	0.384*** (0.079)	0.377*** (0.133)			0.374*** (0.079)	0.369*** (0.133)
rural locality	-0.228*** (0.031)				-0.208*** (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 A38: First Stage Regression for Total Expenditure: Nuclear Households with Children

	ln(total expenditure)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Wealth instrument)	0.079*** (0.005)	0.055*** (0.004)	0.025*** (0.005)	-0.105*** (0.014)	-0.074*** (0.012)	-0.020 (0.013)
ln(Wealth instrument) ²				0.012*** (0.001)	0.009*** (0.001)	0.003*** (0.001)
age wife	-0.002 (0.009)				-0.007 (0.009)	
age husb	0.025*** (0.008)				0.022*** (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*** (0.021)				0.239*** (0.020)	
secondary_husb	0.215*** (0.024)				0.195*** (0.024)	
log(household size)	0.110 (0.177)	0.102 (0.247)			0.075 (0.172)	0.089 (0.251)
rural locality	-0.226*** (0.031)				-0.208*** (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.

A.6 Violent Crime: Distribution Factors or Taste Shifter?

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 (10b).

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 ,

$$\frac{\partial W^m}{\partial H_j} = -\frac{\partial \eta}{\partial H_j} \left(\frac{W^m}{(1-\eta)} + \beta^m \right) \quad (\text{A3})$$

$$\frac{\partial W^m}{\partial H_j} \geq 0 \quad \text{if and only if} \quad \frac{\partial \eta}{\partial H_j} \leq 0. \quad (\text{A4})$$

The empirical results provide evidence of $\frac{\partial W^m}{\partial H_j} > 0$ in male clothing. Because the second term of equation (A3) 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,

$$\frac{\partial W^m}{\partial H_j} = -\frac{\partial \eta}{\partial H_j} \left(\frac{W^m}{(1-\eta)} + \beta^m \right) + (1-\eta) \left(\frac{\partial \alpha^m}{\partial H_j} + \frac{\partial \beta^m}{\partial H_j} \ln((1-\eta)y/n^m) \right) \quad (\text{A5})$$

$$\frac{\partial W^m}{\partial H_j} \geq 0 \quad \text{if and only if} \quad \frac{\partial \eta}{\partial H_j} \leq 0. \quad (\text{A6})$$

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 $\frac{\partial \eta}{\partial H_j} \geq 0$.