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The Gendered Impacts of Income Fluctuations on Household Departure, Labor Supply, and Human Capital Decisions: Evidence from Kyrgyzstan

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Abstract

How do fluctuations in income affect labor supply decisions, and how do their effects differ by gender? We analyze data from a 13-year rolling panel in Kyrgyzstan spanning 2004—2016. We address the endogeneity of fluctuations in income to labor supply decisions using a household fixed effects model and exploiting region-level changes over time in growth rates of different sources of revenue and production costs to which households have varying levels of baseline exposure. We find that reductions in income relative to the median spur departure from the household (e.g., due to migration or new household formation), with smaller impacts on women than men. However, women's labor supply at the origin is affected significantly more than that of men, with short-term increases in hours of employment and declines in home production and other activities. Reductions in income also fuel temporary migration for both genders, with larger effects for men, and widen the gender gap in pursuit of non-compulsory education.

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Income fluctuations are ubiquitous in low-income countries; they may stem from price fluctuations, health shocks, insecure property rights, adverse weather, livestock deaths, job loss, unreliable service delivery, or a host of other sources. Many households engage in informal, inter-household insurance arrangements (e.g., Coate and Ravallion 1993; Udry 1994; Platteau 1997; Skoufias and Quisumbing 2005, and others). However, poor households frequently under-insure against negative shocks (Rosenzweig 1988; Townsend 1994; Dercon 2002). If individuals cannot share risk, they may self-insure by sending migrants (Kennan and Walker 2011; Clemens, Özden, and Rapoport 2015; Kleemans 2015; Morten 2019) or increase hours of labor supplied at the origin (Kochar 1999; Kwon, Orazem, and Otto 2006). At the same time, households facing negative shocks may have less ability or desire to finance migration (Halliday 2006; Gray and Mueller 2012; Angelucci 2015; Hirvonen 2016).

Income fluctuations are likely to have gendered effects. In low-income country contexts, women and men tend to have vastly different levels of mobility and integration into formal labor markets, and distinct types of employment and domestic responsibilities (Walker and Ryan 1990; Pryck and Termine 2014). Women often have relatively less access to land (Doss, Meinzen-Dick, and Bomuhangi 2014; Doss et al. 2015), agricultural and non-agricultural inputs (Quisumbing 1996; Peterman, Behrman, and Quisumbing 2014), and financial services (Fletschner and Kenney 2014). They may also face greater barriers to migration (Topel 1986; Bound and Holzer 2000; Belot and Ederveen 2012; Chort 2014; Fleury 2016). Disproportionately male out-migration may simultaneously increase labor burdens on women who remain at the origin (Hadi 2001; Deere 2005; Desai and Banerji 2008; Chang, Dong, and MacPhail 2011; Radel et al. 2012; Gioli et al. 2014). Nonetheless, existing literature rarely distinguishes how effects of income fluctuations vary with gender.

In this article, we consider the effects of fluctuations in income on women's and men's decisions related to household departure (i.e., ceasing to be a household member, due to migration or otherwise forming or joining a new household), labor supply, human capital accumulation, and temporary migration. We use individual-level data from the Kyrgyz

Integrated Household Survey, a 13-year rolling panel spanning 2004—2016. We address the endogeneity of fluctuations in income to labor supply decisions using a household fixed effects model and exploiting region-level changes over time in growth rates of different sources of revenue and production costs to which households have varying levels of baseline exposure, following Bartik (1991).

We find that reductions in household income spur household departure, though with smaller impacts on women than men. However, within the origin household, women's labor supply is affected significantly more than that of men, with increases in hours of employment and declines in home production and other activities (e.g., leisure, sleep, and domestic responsibilities). Reductions in income also fuel domestic temporary migration for both genders, with statistically significantly larger impacts on men than women. We further find that the likelihood that youth aged 15–25 (i.e., beyond the age of compulsory schooling) are studying declines in the year of a reduction of income, with similar effects on both genders. A year later, however, only young women's education is negatively affected, suggesting that negative income shocks may increase gender gaps in access to non-compulsory education.

Our study contributes to a large literature on the impacts of negative income shocks on the welfare of the rural poor (Jalan and Ravallion 1999; Jayachandran 2006; Kosec and Mo 2017; Ganong et al. 2020). We extend this literature by studying the gendered dimensions of income fluctuations. Further, many existing studies consider either targeted cash transfer programs or extreme shocks that are arguably natural experiments (Zhi et al. 2013; Majbouri 2016). Our focus helps isolate the consequences of income fluctuations from trauma of extreme shocks, and our findings apply to those not targeted by transfers.

We also contribute to growing literature on the so-called feminization of agriculture, which considers how changing rural landscapes affect women (Deere 2005; Lastarria-Cornhiel 2006; De Schutter 2013; Padmaja et al. 2019; Tavenner et al. 2019; Doss et al. 2020; Khatri-Chhetri et al. 2020). This literature draws attention to women's paid and unpaid workloads and agency within and beyond the household. We consider a particular driver of rural change

becoming increasingly common due to climate change—fluctuations in income.

Background

Located in Central Asia, land-locked Kyrgyzstan moved from low-income to lower-middle income status in 2014. In 2004, it had a GDP per capita of $757, which by 2016 was $1,042 (both in constant, 2010 USD). While poverty declined between 2004–2009, it remained relatively stable during 2009–2016 (see appendix figure A1); during this latter period, about 22 percent of the population lived on less than $3.20/day (using 2011 international prices)—the international poverty line for lower-middle income countries (World Bank 2017b).

Migration

Given high rates of poverty, many Kyrgyz have emigrated—largely to Russia, and to a lesser extent Kazakhstan—to seek better economic opportunities. About 0.65–1 million Kyrgyz, roughly 40 percent female and 60 percent male, work abroad (OSCE 2015). Figure A2 illustrates, in sub-figure (a), how the difference between the GDP per capita of Kyrygzstan and each of Russia and Kazakhstan grew steadily during 2004–2016. This helps explain why remittances in Kyrgyzstan also grew steadily over this period, both overall (sub-figure (b)) and as a share of GDP (sub-figure (c)). Globally, Kyrgyzstan was second only to Nepal in 2016 in terms of remittances as a share of GDP (sub-figure (d)).

Internal migration is also common in Kyrgyzstan. In our dataset, 18 percent of individuals were born in another community and 5 percent were born in another oblast (i.e., region). About 2 percent (3 percent) of individuals in our sample were domestic (international) temporary migrants for at least one quarter of the year (see table 1, Panel A).

Employment and education

Throughout our study period of 2004–2016, at least 64 percent of the population lived in rural areas (World Bank 2017a). A full 39 percent of employment in 2004 and 27 percent in 2016 was in agriculture. The vast majority of agricultural production takes place on smallholder farms (FAO 2015).

During 2004–2016, 45–50 percent of Kyrgyz women 15 and over were employed—more than 20 percentage points below the rate for men (see appendix figure A3). The gender gap in labor market participation decreased rapidly since Kyrgyzstan declared independence in 1991 (Schwegler-Rohmeis, Mummert, and Jarck 2013). Potential drivers are increasing social transfers (Barrientos and Kudebayeva 2015), male-dominated labor migration (Justino and Shemyakina 2012; Mukhamedova and Wegerich 2018; Kan and Aytimur 2019), and norms of patrilocal residence (Landmann, Seitz, and Steiner 2018). Outside agriculture, women are employed primarily in low-paid service sector jobs (Karymshakov and Sulaimanova 2017). Kyrgyz women also perform the majority of unpaid domestic work—engaging in three times as much housework and twice as much childcare as men (National Statistical Committee of the Kyrgyz Republic 2015). Migration for work is male-dominated. However, about 57 percent of married male migrants migrate with their wives, and about 90 percent of these women work at the destination (OSCE 2015).

In Kyrgyzstan, children must attend school through grade 9 (roughly, from ages 7 to 15). Grades 10 and 11 are non-compulsory and can be either general or vocational. Higher education is dependent on preparation and ability to pay. In 2008–2009, there were 50 higher education institutions in the country and average annual tuition was 12,248 soms—about 315.8 (constant, 2010 USD) (OECD 2010).

Conceptual Framework

Analysis of the impacts of income fluctuations requires attention to gender, as men's and women's labor supply, human capital accumulation, spatial movement, and related decisions are shaped by their different access to and control over resources, often inequitable access to employment opportunities, and norms that govern expectations around domestic responsibilities (Motiram and Osberg 2010) and local and distant livelihood opportunities (Xiao and Asadullah 2020; Jayachandran 2021). At the same time, fluctuations in income have the potential to change support for (young) women taking on particular roles. For example, declines in income may fuel both women's and men's support for women's economic participation (Attanasio, Low, and Sánchez-Marcos 2005; Kosec et al. 2021), or lead to a decline in girls' access to education more than that of boys (Evans and Yuan 2019).

As external shocks like reductions in income affect decisions around labor and human capital, one narrative found in the literature describes the notion of "left behind women"—describing migration as more common among men, and leading women to simultaneously experience improved autonomy and increased responsibility (Desai and Banerji 2008; De Haas and Van Rooij 2010; Choithani 2020; Brauw, Kramer, and Murphy 2021). A second narrative argues that such shocks can provide at least some opportunities for women's economic empowerment and gender equality; as women move into paid employment and earn more income, they may also gain greater control over expenditures and visibility and voice within their household and community (Fakir and Abedin 2020). Less male control over their mobility, time use, and use of income may also incentivize women to work after men migrate out (Spierings 2014), as may a weakening of the link between work and exposure to domestic violence (Heath 2014). We interrogate these (not necessarily mutually exclusive) narratives, focusing not only on the intensity of women's labor supply at the origin, but also the degree to which they undertake household departure and temporary migration in response to shocks, and how their likelihood of pursuing non-compulsory education is affected.

We advance several hypotheses, justified by different conditions faced by women and men

highlighted above. Hypothesis 1 (H1) is that women and men will undertake household departure and temporary migration in response to decreases in income, with smaller impacts on women compared to men owing to greater barriers to migration faced by women. Hypothesis 2 (H2) is that women who do not depart the household in response to a decrease in income will increase hours of labor supplied due to a the need to compensate for lost income; increased perceived economic uncertainty; likely delays in the arrival of remittance income (if anyone migrated away); and reduced barriers to employment and control of income by men—though impacts may be small due to continued domestic responsibilities and persistent normative barriers. Men may or may not be impacted. Hypothesis 3 (H3) is that declines in the likelihood of pursuing non-compulsory education will be concentrated among women owing to lower perceived utility of education for women given prevailing gender norms surrounding outside work. We test these hypotheses in the following sections.

Empirical Strategy

Our data source is the Kyrgyz Integrated Household Survey (KIHS), a nationally-representative, multi-topic rotating panel household survey conducted quarterly during 2003–2016 (National Statistical Committee of the Kyrgyz Republic 2016).[1] The primary respondent is the household head or a knowledgeable member, who completed a household roster and employment module covering individuals aged 15–65, among other modules. Each year up to 2013, up to 25 percent of households exited the sample; in 2013, an entirely new sample was selected. Figure A4 plots the distribution of years of entry of households; it reveals a bimodal distribution in which nearly 60 percent of the sample is roughly evenly split between entering in 2004 and 2013. There are on average three observations per household each year, and the median household is in the sample for four years (the average is 5.48 years, and the S.D. is 2.54 years). In total, we study 164,997 individuals from 14,934 households.

[1] See detailed description in Esenaliev, Kroeger, and Steiner (2011).

Quarterly data are aggregated to be annual given data limitations. First, household departure is only observed annually, when the household roster is updated. Second, while income data were collected quarterly, they were released as annual aggregates for several years.[2] Net income consists of income from non-agricultural sources (self-employment, wage employment, transfers from government, transfers from individuals, and other income) as well as income from agriculture (crop production, livestock sales, meat production, and processed food production)—net of costs associated with crop and livestock production.

As table 1, Panel C shows, average annual household median income is 124,356 soms/ year (in constant, 2010 soms), which is about 2,706 USD (about 644 USD per capita given average household size of 4.2 members).[3] The sample is 46 percent male, the average age of individuals is 39 years old, and about two-thirds of individuals are married (Panel B).

Household departure outcomes

Our sample comprises individuals aged 15–65 as employment modules were administered only to this age group. Lacking a detailed permanent migration module covering motives for moving and destinations (we do have detailed information about temporary migration), we proxy for permanent migration in year t with an individual-level indicator for no longer being on the household roster (completed during the quarter 1 visit – i.e., during January – March) in year t despite being present in year $t-1$, which we call household departure in year t. This follows a number of recent migration studies (Mueller, Gray, and Kosec 2014; Chen, Kosec, and Mueller 2019b, 2019a). Since we cannot observe departures pre-dating household entry into the sample, this variable is missing the first year the individual appears in the sample. After taking on a value of 1, it is missing in all subsequent periods if the individual does not return. If the individual does return, it again takes on a missing value

[2]Incomplete income data from 2003 led us to drop that year. Additionally, We drop household-years with 3 or fewer months of data, and up-weight observations from household-years with 4–11 months.

[3]The Kyrgyz. som–USD exchange rate was 45.95 on June 1, 2010 (National Bank of Kyrgyzstan 2019).

in the year they return, and a 0 or 1 the following year.[4] The average value of the household departure indicator is 0.09 (Table 1). This statistic is slightly smaller for women, at 0.08, and slightly larger for men, at 0.10 (see table A1). We also consider an indicator for anyone aged 15–65 departing the household; this variable has a mean of 0.16 (table 1).

We lack data on the motive for household departure; it may be for employment, marriage, forming a new household, etc. The reason could be death, though our sample is under 65, reducing the likelihood of this explanation. As a robustness check, we further show that results hold when considering only those under 50.

Comparing characteristics of individuals who permanently depart at some point with those who do not (table A2), individuals that departed are on average 11 years younger (with an average age of 27), 31 percentage points less likely to be married, 7 percentage points more likely to be male, and 13 percentage points less likely to have a general secondary degree or higher. Figure A5 presents a kernel density plot of the age of individuals who departed and those who did not. Rates of household departure decline after age 18. Figure A6 considers how the incidence of household departure across the life cycle varies with gender and marital status. At nearly all ages and for both women and men, the unmarried are more likely to migrate than the married, consistent with either marital motives for departure or marriage retaining members at the origin. Appendix figure A7 reveals, in eight oblast-specific sub-figures, spatial and temporal variation in household departure.

Our household departure indicator takes on a 1 in year t if an individual is already gone in quarter 1 of year t; we thus know the departure occurred after completion of the year $t-1$ roster (when they were present) and before completion of the year t roster. This motivates us to adopt one-year, two-year, and three-year lagged values of our income fluctuation variable to learn, respectively, the household departure response in the year of the income fluctuation or up to three months after it (lag $r = 1$), during the prior calendar year or up to three

[4]Results are similar when we do not allow an individual to re-enter the sample after exiting—and thus only consider the first departure (table A3); 1 in 10 returned home.

months into the current calendar year (lag $r = 2$), or two full calendar years prior or up to three months into the prior calendar year (lag $r = 3$). This is visualized in figure 1.

Labor supply, human capital, and location of work outcomes

We construct several individual-level outcomes for current household members capturing decisions about labor supply, human capital accumulation, and temporary migration. We consider six labor supply outcomes. The first is the share of the year one has a paid job or work on a family farm or enterprise (i.e., is employed), which we code by considering the share of quarters (of four) for which they do. This variable has a mean of 0.58 (table 1), though is 0.48 for women and 0.69 for men (table A1). We also have a set of three outcomes indicating the average (across four quarters) hours in the last week that the individual dedicated to employment, home production, and other activities (e.g., leisure, sleep, and unpaid domestic work). Average hours of employment in the last week is 20.63, but it is 16.34 for women and 25.57 for men. We finally include indicators for working multiple jobs in the last week during at least one of the four quarters (on average, 12 percent did), and indicating a desire to work more if it provided additional income during at least one of the four quarters.

To capture human capital accumulation, we construct an indicator for being a full-time student in at least one of the four quarters, analyzed for 15–25 year olds (i.e., those beyond the age of compulsory schooling). Its mean is 0.57 (0.58 for women and 0.56 for men).

Finally, we capture temporary migration of current household members via a set of indicator variables for different main locations of work: in the same oblast, in another oblast (internal temporary migration), or in another country (international temporary migration). These indicators are coded as one if the individual worked in the location for at least one quarter of the year, and thus are exhaustive but not mutually exclusive. We note that temporary migrants could be commuters.

We estimate specifications using income fluctuations from the year in which labor supply and human capital outcomes were measured (lag $r = 0$), the previous year (lag $r = 1$), and

two years prior (lag $r = 2$). Appendix figure A8 plots trends of household departure and labor supply outcomes over time, revealing diverse trends by outcome.

Econometric model

We estimate the following fixed effects model:

$$D_{ijt} = \beta_0 + \beta_1(H_{j,t-r}) + \beta_2 H_{j,t-r} G_{ijt} + \beta_3 \boldsymbol{X_{jt}} + \beta_4 \boldsymbol{Y_{ijt}} + \alpha_j + \mu_t + \epsilon_{jt} \quad (1)$$

where i indexes individuals, j indexes households, t indexes years, and r indicates the lag structure in years (i.e., 0, 1, 2, or 3). α_j are household fixed effects, and μ_t are year fixed effects.[5] D_{ijt} is a household departure, labor supply, human capital, or temporary migration outcome. H_{jt} is the fluctuation in net income experienced by household j in year t relative to that household's median income (computed across all survey years). It takes the difference between year t net income ($I_{j,t}$) and median net income (MI_j) as a share of median net income; positive (negative) values indicate above- (below-) median net income. Formally:

$$H_{j,t} = \frac{I_{j,t} - MI_j}{MI_j} \quad (2)$$

where $I_{j,t}$ is net household income in year t and MI_j is median net household income. As $I_{j,t}$ is always positive in our sample, we note that $H_{j,t}$ has a lower bound of -1.0, but it has no upper bound. Figure A9 plots $H_{j,t}$; the distribution is roughly centered around 0. The average negative fluctuation in net income relative to the median is -20.94 percent (e.g., earning 79,060 soms when typical household income is 100,000), while the average positive fluctuation is 28.20 percent (e.g., earning 128,200 soms when median income is 100,000).

We graph the temporal variation captured by $H_{j,t}$ in figure A10, which shows sector-specific changes in income from that sector relative to median income from that sector over

[5] Household fixed effects capture, for example, household ethnic composition and migrant networks.

time. Figure A10a shows non-agricultural income sources, figure A10b shows agricultural income sources, and A10c shows agricultural cost sources. The figures show that in no year do we observe all 9 sources of income experiencing positive growth relative to the previous year. We also never observe contractions in all sectors in a given year. Both non-agricultural and agricultural income sources display a great deal of volatility. Overall, the figures suggest that our analysis draws on a variety of different and often opposite shocks.

G_{ijt} is an indicator for the respondent being male; for women, the effect of $H_{j,t-r}$ on outcomes is thus β_1, while for men it is $\beta_1 + \beta_2$; in our tables, we present both β_1 (effect on women) and $\beta_1 + \beta_2$ (effect on men), as well as the p-value for the difference between the effect on women and that on men, which corresponds to the p-value for β_2.

$\boldsymbol{X_{jt}}$ includes a linear time trend interacted with each of: initial period net household income, initial period income from each of the nine income sources, as well as the initial period costs faced by the household from each of the two cost sources (all logged). $\boldsymbol{Y_{ijt}}$ is a vector of individual-level controls, which come from the household roster and correspond to the individual (rather than the respondent). These include a male indicator (G_{ijt}), age, age squared, and indicators for marriage, complete general secondary or higher education, and one's relationship with the head. We include in all specifications household fixed effects, year fixed effects, and $\boldsymbol{X_{jt}}$, and for some outcomes show results both with and without $\boldsymbol{Y_{ijt}}$.[6]

Identification

Our analysis constructs an instrumental variable capturing exogenous shocks to household income following a methodology popularized by Timothy J. Bartik (1991). The intuition is to generate a predicted shock to returns to economic activity in the sectors in which a household generates income using the composition of a household's income coming from each of the sectors in a base year (here, the year a household enters the sample) and nation-wide growth in incomes in those sectors over time. This variable accordingly captures shocks to

[6]For household level outcomes, we omit household fixed effects and individual level controls.

returns to economic activity that are uncorrelated with endogenous changes in the household's reliance on different sectors. We consider 9 sectors (i.e., interchangeably referred to as sources of income): harvested crops and gathering; livestock and hunting; meat production; food processing; non-farm self-employment; non-farm wage employment; transfers from government and NGOs (includes benefits, discounts, and subsidies); transfers from individuals; and other non-farm income (including from financial assets and sales of properties). We omit the household's own data when computing growth rates in income for each sector over time.

Table A4 shows, for both non-agricultural (Panel A) and agricultural (Panel B) income sources, the average share households earn from that source at baseline. Income from non-agricultural wage employment is the largest source, comprising 41.6 percent of income on average. The next largest is income from self-employment (15.1 percent), followed by transfer income from government (13.3 percent) and income from harvested crops (13.2 percent).

We construct the predicted growth rate in total income, $GI_{j,t}$ for household j in year t since base year $t = b_j$ (the year household j entered the sample) as follows:

$$GI_{j,t} = \sum_{s=1}^{9} IS_{j,s,b_j} \times \frac{N_{s,\sim j,t} - N_{s,\sim j,b_j}}{N_{s,\sim j,b_j}} \tag{3}$$

where IS_{j,s,b_j} is the share of income household j earned from sector s in base year $t = b_j$, $N_{s,\sim j,t}$ is the national household average (excluding the household's own data) amount of income earned from sector s in year t, and $N_{s,\sim j,b_j}$ is the national household average (excluding the household's data) amount of income earned from sector s in base year $t = b_j$. Eq. 3 provides a predicted growth rate for income in household j between year $t = b_j$ and year t, holding the composition of sectors fixed at baseline levels and assuming that each household's income from sector s grows at the nation-wide rate for that sector.

We construct the predicted growth rate in input costs analogously, including only house-

holds with at least one non-zero input cost (i.e., whether crops or livestock) at baseline:

$$GC_{j,t} = \sum_{c=1}^{2} IC_{j,c,b_j} \times \frac{N_{c,\sim j,t} - N_{c,\sim j,b_j}}{N_{c,\sim j,b_j}} \tag{4}$$

where $IC_{j,c,b}$ is the share of costs household j faces from cost source c (either crops or livestock) in base year $t = b_j$, $N_{c,\sim j,t}$ is the national household average expenditure on cost source c in year t (excluding the household's data), and $N_{c,\sim j,b_j}$ is the national household average expenditure on cost source c in base year $t = b_j$ (excluding the household's data). By construction, as we only include in Eq. 4 households with non-zero input costs in year t_{b_j}, these cost shares add up to one. For each year t, Eq. 4 yields a predicted growth rate for input costs assumed by household j between year $t = b_j$ and year t, holding the household's relative exposure to different input costs fixed at baseline levels and assuming that each household's input costs from cost source c grow at the same rate observed for nationwide inputs costs from that source. For households facing no costs in year $t = b_j$, we set $GC_{j,t} = 0$.

We then employ these predicted growth rates to construct predicted net income for household j in year t as follows, where TI_{j,b_j} denotes total income for household j as reported in its first year in the sample, TC_{j,b_j} denotes total input costs for household j as reported in its first year in the sample, and $PI_{j,t}$ is predicted net income in year t:

$$PI_{j,t} = (1 + GI_{j,t}) \times TI_{j,b_j} - (1 + GC_{j,t}) \times TC_{j,b_j} \tag{5}$$

We next calculate predicted income shocks as follows. Denoting the household's median value of predicted net income across all years as MPI_j, we define instrumental variable $S_{j,t}$ as the change in predicted net income relative to median predicted net income:

$$S_{j,t} = \frac{PI_{j,t} - MPI_j}{MPI_j} \tag{6}$$

We then instrument for $H_{j,t}$ in Eq. 1 using $S_{j,t}$. Results from this first stage regression

appear in table 2; whether or not we include our vector of individual-level controls Y_{ijt}, we estimate a positive relationship between the actual and predicted change in income relative to the median for which the the overall first stage F-statistic is above 500.

Results

Household departure

Table 3 considers the outcome of household departure and presents IV results for women and men utilizing 1-, 2-, and 3-year lags of our income shock. We present results with (column 1) and without (column 2) individual controls, showing that results are not sensitive to their inclusion. Hereafter, we present results only with our full set of controls.[7]

From our column 2 specification, we see that a negative shock to income significantly increases the likelihood of household departure for both genders.[8] For women, impacts are fairly immediate but short-lived. After one year, a typically-sized 20 percent decline in household income relative to the median leads to a 0.6 percentage point increase in the likelihood of household departure (i.e., $0.2 \times 0.030 \times 100$). Compared to an average of 8 percent of women departing the household in a given year, this decline represents a 7.5 percent increase over the mean. Indeed, while the point estimate for men after one year is larger (0.043 for men compared to 0.030 for women), we cannot reject the null that the impacts on both women and men after one year are the same. When considering higher lags of our income shock, we find no statistically significant impacts on women.

[7]Following John Bellows and Edward Miguel (2009), we estimated that selection on unobservables would have to be 2.31 (6.14) times greater than selection on observables for women (men) to explain away the entire effect of the income shock. This is computed by comparing columns 1 and 2 in Panel A of table 3, which yields -0.030 / (-0.043 + 0.030) = 2.31 for women, and -0.043 / (-0.050 + 0.043) = 6.14 for men.

[8]While our analysis allows multiple potential departures by the same individual following a return to the household, similar results hold when restricting attention to the first departure (see table A3).

For men, in contrast, a negative shock to income spurs migration across all lag structures (1, 2, and 3 years). Impacts for men are largest when we measure income two years prior to exiting the household roster, where a typically-sized 20 percent decline in household income relative to the median leads to a 1.1 percentage point decline in the likelihood of household departure (i.e., $0.2 \times 0.055 \times 100$). Compared to an average of 10 percent of men departing the household, this decline represents an 11 percent increase over the mean. Further, in this two year lag model, we can reject that the impacts on men are the same as those on women. When using a three year lag, the effect size for men drops only slightly (from a coefficient of 0.055 to 0.054), suggesting a sustained impact on the likelihood of departing the household. Overall, these findings support H1; both women and men will undertake household departure in response to decreases in income, with smaller impacts on women compared to men.

In table A5, we consider whether the household had anyone aged 15–65 (column 1), a woman (column 2), or a man (column 3) depart. With a one year lag, a 20 percent reduction in income relative to the median yields a 2.2 percentage point increase in the likelihood of anyone departing; as 16 percent of households have a member depart on average, this is a 14 percent increase over the mean. Two years (three years) later, the same 20 percent income decline spurs a smaller but still sizeable 1.8 (2.0) percentage point increase in the likelihood of departure. For all three lags, the effect is driven by departure of men (column 3).

Labor supply

Next, we consider labor supply outcomes by gender in table 4. We find that a decline in income relative to the median modestly increases the share of the year that women, but not men, are employed; this holds across all three lag structures (0, 1, and 2) (column 1). Further, the difference between the effect on women vs. men is always itself statistically significant. This may reflect lower underlying rates of labor force participation by women and thus women's greater ability to adjust in response to negative income shocks. In the same year as a 20 percent decline in household income relative to the median, women begin

to work 1.1 percent more of the year (i.e. about 4.1 more days). As the mean share of the year that women are employed is 0.48, this is roughly a 2.4 percent increase over the mean. With a one year lag, the effect size falls to women working 0.78 percent more of the year (a 1.6 percent increase relative to the mean), but then rises to 1.2 percent more of the year spent working when using a two year lag (a 2.5 percent increase relative to the mean).

Hours of employment are also differently impacted for women compared to men. In the year of a 20 percent decline in household income relative to the median, women work 0.48 hours more per week; as women work 16.34 hours at the mean, this is a 2.9 percent increase. Men also work more, but a more modest 0.27 hours per week that is statistically significantly smaller than the effect on women. For women and men, some of this increase comes at the expense of home production. However, only women significantly decrease hours spent not working (i.e., time spent on leisure, sleep, as well as unpaid domestic work). With a one year lag, we see no impacts on either gender. With a two year lag, we see a shift; women *and* men tend to work less, though men realize 2.5 times more gains in hours not working than do women. These findings support H2; women who do not depart the household in response to a decrease in income increase hours of labor supplied.

Increases in hours of employment may stem from labor force entry, working more hours in one job, or taking on additional jobs. As table 5 shows, we find no evidence that declines in income relative to the median spur employed individuals to work multiple jobs (column 1). Indeed, it is associated with modest declines in this behavior across all three lags.

We observe no impacts of negative income shocks on the desire to work more hours—a sign of underemployment—in the year of the shock or a year later. However, two years later, we find significant increases in individuals' desires to work more hours that are statistically significantly larger for men. A 20 percent decline in income relative to the median increases men's (women's) likelihood of wanting to work more by 2.9 (2.1) percentage points.

We also find that the type of work in which individuals engage changes with fluctuations in income. In household-level regressions in table A6, we show that negative shocks to income

reduce reliance on agriculture, both on the extensive and intensive margins.

Human capital accumulation

Table 5, column 3 considers the impacts of fluctuations in income on human capital accumulation of youth aged 15–25. In the year of a reduction in income relative to the median, both young women and men become less likely to attend (non-compulsory) school—with statistically indistinguishable impacts across genders. The effect of a 20 percent reduction in income relative to the median is not small in the year of the shock; young women become 2.4 percentage points less likely to attend non-compulsory school (i.e., upper high school or higher education), and young men become 1.8 percentage points less likely.

However, there are marked (and statistically significant) differences in the impacts of income shocks across genders for further lagged values of our income shock. Using a one year lag, the income shock makes young women significant less likely to be enrolled in school, while the effect is opposite-signed and statistically insignificant for men. Two years later, we find no impact on young women, but the 20 percent decline in household income relative to the median actually contributes to a 1.7 percentage point *increase* in the likelihood that young men are in school. This suggests that declines in income may widen the gender gap in pursuit of non-compulsory education. Overall, it supports H3 that declines in the likelihood of pursuing non-compulsory education will be concentrated among young women.

Temporary migration

Table 6 presents analysis of the location of work for current, working household members. The outcome in column 1 is an indicator for the main place of work being in the same oblast, column 2 is in another oblast (i.e., being a domestic temporary migrant), and column 3 is outside of the country (i.e., being an international temporary migrant).

We find no evidence that declines in income relative to the median drive international temporary migration, but we observe significant increases in domestic temporary migration

for both women and men that are present in the year of the shock, and largest two years after the year of the shock. In the year of a 20 percent decline in income relative to the median, we observe a 0.32 (0.42) percentage point increase in domestic temporary migration by women (men)—two effect sizes that are statistically indistinguishable. These are large increases relative to the sample means of 2 (3) percent for women (men). Further, the effect sizes grow over time such that, two years following the 20 percent decline in income relative to the median, women become 0.56 percentage points and men become 0.64 percentage points more likely to be domestic temporary migrants (the effects are again statistically indistinguishable across genders). Thus, we see that engaging in domestic temporary migration (while remaining a household member) is an employment strategy that both women and men employ in response to a reduction in income and the associated desire to work more hours. These findings broadly support H1; both women and men do undertake temporary migration in response to decreases in income, and effect sizes are always smaller for women compared to men, even if differences across genders are not generally statistically significant.

Heterogeneous effects by household type

It is useful to understand which types of households are most vulnerable to income fluctuations, and on which margins. We accordingly dichotomize our sample in three ways: urban vs. rural households (table A7); households earning at least half of income from agriculture vs. less than half (table A8); and households earning some income from agriculture vs. none (table A9). None of these six groups emerges as clearly driving the results, and there are significant impacts across our array of outcomes for all. A few points are noteworthy.

Comparing urban vs. rural households, the lack of statistically significant differences is striking, as shown in table A7. One exception is the desire to work more hours; a decline in income significantly reduces this outcome for urban women and men, while it significantly increases it for rural women and men. This may reflect greater opportunities for work in urban areas whereas rural labor markets cannot absorb greater supply. A complementary

finding is that domestic temporary migration is a rural phenomenon.

A comparison of households earning at least half of income from agriculture vs. less (table A8) reveals that increased labor force participation is largely a phenomenon of women outside of agriculturally-dependent settings. When we compare households with vs. without agriculture income (table A9), we see that permanent departure from the household following an income decline is a more common strategy among those with agricultural income.

Overall, the results suggest that rural, agriculture-dependent households are more prone to indicate under-employment and engage in household departure and domestic temporary migration following a negative income shock than their urban and non-agriculturally dependent counterparts. In contrast, urban and less agriculturally-dependent households are more likely to increase hours of work and less likely to indicate underemployment.

Robustness

Tests for plausibility of identifying assumptions

We follow Paul Goldsmith-Pinkham, Isaac Sorkin, and Henry Swift (2020) and recast our income shock instrument as an over-identified GMM estimator where the baseline shares from each income source are treated as a set of individual instruments under a weighting matrix. The weights, known as Rotemberg (1983) weights, highlight shares for which our estimates of the effects of income shocks are most sensitive to any endogeneity. This analysis is detailed in Appendix C. There, we establish that three of our 9 sectors have the highest Rotemberg weights: income from harvested crops, agricultural income from livestock, and agricultural income from food processing (table A10). We also find that while some household-level observables predict the share of income from these three sectors, their effects are often small and frequently insignificant (table A11). Finally, we show that even household-level observables that are predictors of the three shares are usually not economically and statistically significant predictors of changes in our outcomes over time (table A12). We interpret this

as support for exogeneity of our shares, and validity of our empirical strategy.

Accounting for large income shocks

We have interpreted our results as the impacts of typical fluctuations in income commonly faced by households. Here, we check the robustness of our main results to three alternative specifications that account for large shocks. Specifically, we code an indicator for a large shock to income in year t that takes on the value of 1 if the absolute value of the percentage change in household income relative to the median in year t is greater than 50 percent. We then estimate our Eq. 1 specification while: a) controlling for the large shock indicator and its interaction with gender; b) controlling for the large shock indicator and its interaction with gender, instrumented with a predicted large shock indicator and its interaction with gender; and c) omitting households for which the large shock indicator ever equals 1. As table A13 shows, our results are broadly preserved under all three alternative specifications, and the coefficient on income shocks in many cases becomes larger and more significant.

Utilizing narrower age ranges

In table A14, we consider the sensitivity of our findings to the age range used. We try: a) excluding older individuals (use ages 15–50); b) including only youth (use ages 15–25); and c) excluding youth and older individuals (use ages 25–50). Our results are generally preserved under (a), suggesting that they are robust to considering migration-prone individuals not likely to be departing the household due to death. We also find results largely preserved under (c), which further omits those most likely to be departing due to marriage.

Sensitivity analysis

Our empirical strategy analyzes impacts of deviations of household income relative to the median. Another approach is to use income itself. Table A15 presents our original specification

(columns 1–4) alongside specifications using logged income (columns 6–9) and non-logged (standardized) income (columns 11–14). Results are preserved under both approaches.

In table A16, we consider the sensitivity of results to two ways of trimming the sample: omitting households in the top 3 percent of observations of baseline income and omitting individuals living in the capital city of Bishkek, or urban Osh region (housing the country's second largest city). Our results are highly robust to both samples.

Corrections for multiple hypothesis testing

Our analysis includes many outcomes, and further examines heterogeneous treatment effects by different income lags and genders, making it essential to correct findings for potential false positives that could result. Two popular methods for controlling for the false discovery rates are those due to Yoav Benjamini and Yosef Hochberg (1995) (BH) and Yoav Benjamini, Abba M. Krieger, and Daniel Yekutieli (2006) (BKY). We compute the q-values (i.e., p-values corrected for multiple testing) for each of these methods. We pool all hypotheses—nine for each outcome (men, women, and the difference between the two, for each of three lag structures of the income shock)—into a single group. Original (unadjusted) p-values appear alongside the two corresponding q-values (BH and BKY) in table A17.

Results are generally preserved for both correction methods. For women, while there were 18 statistically significant results (i.e., with p-values under 0.10), the BH method yields 13 q-values under 0.10 and the BKY method yields 14. For men, while there were 18 statistically significant results, the BH method yields 14 q-values under 0.10 and for the BKY method, there are 17. Thus, while already marginally significant results for women often become insignificant, our highly significant results for men broadly remain significant.

Conclusion

The evidence we present suggests that typically-sized income fluctuations have modest short-term impacts on household departure, labor supply, human capital accumulation, and temporary migration—and that these impacts are not uniform across genders. Household departure, employment, hours of employment, and temporary migration all increase for both genders following reductions in income in what appear to be household attempts to cope with the reduction. However, impacts on household departure and temporary migration are larger for men compared to women, while impacts on being employed and hours of employment are larger for women compared to men. These findings reveal that women are not always "left behind" following shocks; they too may respond through changes in labor supply and other livelihood decisions. At the same time, we find that reductions in income may widen gender gaps in access to non-compulsory education; we identify initial reductions for both genders, but a year later, the reduction only persists for women.

One limitation of our study is the fact that the motive for household departure is not tracked, preventing us from equating this with permanent migration, or studying impacts on different types of permanent migration (e.g., long distance vs. short distance, employment-motivated vs. motivated by other reasons, etc). In future research, datasets providing this information could offer more insights into the permanent migration impacts of income fluctuations. We further lack data on sector of employment, so we cannot consider how reductions in income influence the type of work done. Such data might provide a more nuanced understanding of gendered impacts of reductions in income. This is an important area for future research; it could help answer the question of whether women are able to move into more traditionally male roles following male departure from the household.

There are a number of policy implications of our results. First, negative income shocks should be understood as increasing the workloads of women in the short turn; interventions that lead to supporting women's ability to control that income, and that can contribute to norm change related to which genders should bear the brunt of domestic responsibilities,

can help ensure that this income generation actually empowers women. Second, policies affecting incentives for internal migration should take into account the fact that this is not only a male phenomenon; ensuring access to services, housing, and security for women internal migrants as well as men is critical to ensuring that this continues to be a beneficial strategy following negative shocks. Finally, in times of economic downturn, interventions and policies targeted at supporting young women to pursue non-compulsory education may yield dividends; reductions in income may disrupt education in ways that have persistent negative effects on young women but not on young men.

Figure 1: Timing of the measurement of household departure outcomes and income shock

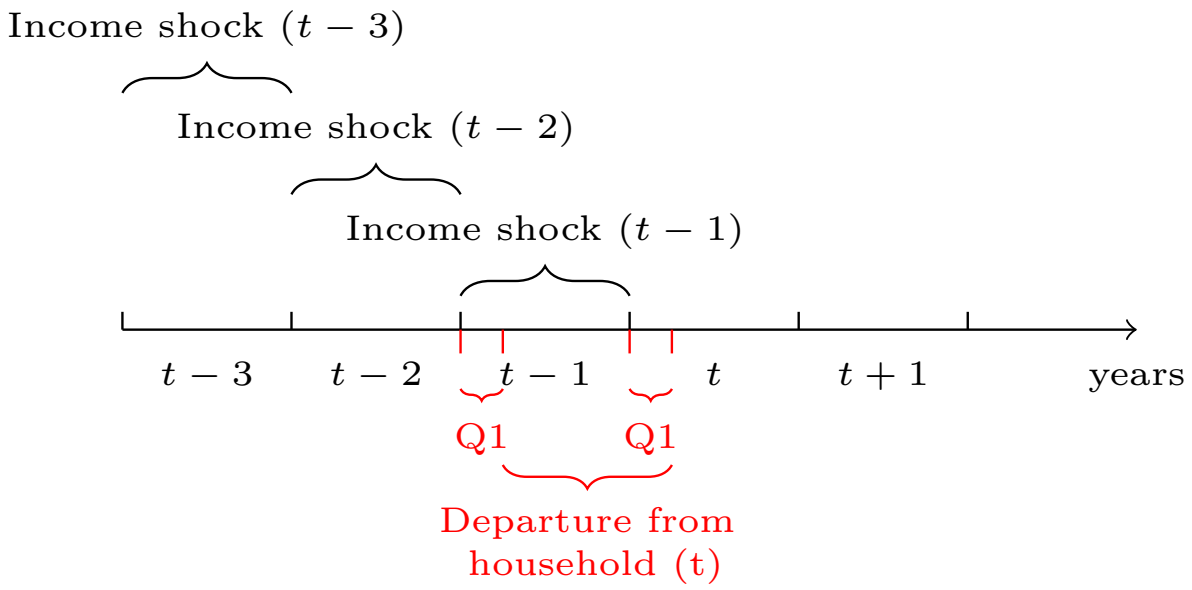

Table 1: Summary Statistics

	N (1)	Mean (2)	SD (3)
Panel A: Individual household departure and employment outcomes			
Dummy—individual left roster	105,155	0.09	0.28
Dummy—individual left roster for the first time in sample	102,793	0.08	0.28
Share of year with paid job and/or work on a family farm or enterprise	153,233	0.58	0.45
Weekly hours: all employment	153,195	20.63	18.96
Weekly hours: home production	153,195	1.15	2.54
Weekly hours: other	153,195	146.22	18.92
Dummy—worked multiple jobs in last week	100,638	0.12	0.33
Dummy—would like to work more, if it provided additional income	100,638	0.30	0.46
Dummy—main place of work is in the same oblast	100,638	0.98	0.15
Dummy—main place of work is in another oblast	100,638	0.02	0.15
Dummy—main place of work is outside the country	100,638	0.03	0.17
Dummy—student (universe: 15-25 years)	46,617	0.57	0.50
Panel B: Individual characteristics			
Dummy—male	105,155	0.46	0.50
Age	105,155	38.56	13.77
Dummy—has general secondary degree or higher	105,155	0.89	0.32
Dummy—married	105,155	0.67	0.47
Relationship to the household head			
Dummy—head	105,155	0.37	0.48
Dummy—spouse	105,155	0.26	0.44
Dummy—son/daughter	105,155	0.26	0.44
Dummy—son/daughter-in-law	105,155	0.08	0.26
Panel C: Household median income			
Total household income (2010 Soms)	14,934	124,356.27	84,734.24
Non-agri, transfer from government	14,934	14,632.36	23,087.20
Non-agri, transfer from individual	14,934	3,464.29	9,209.21
Non-agri, other income	14,934	904.52	3,685.02
Non-agri, income from self-employment	14,934	16,362.78	32,392.41
Non-agri, income from wage employment	14,934	49,197.42	50,023.24
Agri, income from livestock	14,934	4,299.97	14,205.92
Agri, income from meat production	14,934	6,266.88	14,230.10
Agri, income from food processing	14,934	1,690.60	4,625.46
Agri, income from harvested crops	14,934	26,133.49	61,936.81
Cost from crop production	14,934	1,525.48	3,676.28
Cost from livestock production	14,934	1,534.97	3,884.75
Panel D: Household departure outcomes			
Dummy—having a member depart from household	42,561	0.16	0.37
Dummy—having a male depart from household	42,561	0.10	0.30
Dummy—having a female member depart from household	42,561	0.09	0.29
Panel E: Household type variables			
Dummy—urban household	14,934	0.61	0.49
Dummy—households with >= 50% of total income from agricultural	14,934	0.19	0.40
Dummy—households has agricultural income	14,934	0.60	0.49

Source: Authors' calculations based on KIHS 2004–2016.
Notes: Panels A, B, and D are at the individual-year level. Panels C and E are at the household-year level.

Table 2: First Stage Results

	(1)	(2)
Controls added iteratively		
Household and year fixed effects	X	X
Baseline income variables interacted with time trend	X	X
Individual controls		X
Predicted change in income relative to HH median, $t-1$	0.525***	0.526***
	(0.022)	(0.022)
R-squared	0.233	0.234
First-stage F-stat	550	554
N	105,155	105,155

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe is individuals who were 15-65 years old (inclusive). The dependent variable is the percentage change in income relative to household median income. Our instrument is the predicted percentage change in income relative to household median income. All controls are described in the "Econometric Model" section. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table 3: Effects of Income Shocks on Departure from Household

	(1)	(2)
	Dummy—departure from household	
Controls added iteratively		
Household and year fixed effects	X	X
Baseline income variables interacted with time trend	X	X
Individual controls		X
Panel A: IV estimates using income from the previous calendar year		
Effect of income shock $(t-1)$ on women	-0.043**	-0.030*
	(0.019)	(0.018)
Effect of income shock $(t-1)$ on men	-0.050***	-0.043**
	(0.019)	(0.019)
R-squared	0.003	0.089
First-stage F-stat	275.9	277.7
P-Value of Difference	0.587	0.273
N	105,155	105,155
Panel B: IV estimates using income two calendar years prior		
Effect of income shock $(t-2)$ on women	-0.028	-0.024
	(0.023)	(0.022)
Effect of income shock $(t-2)$ on men	-0.057**	-0.055**
	(0.024)	(0.023)
R-squared	0.002	0.089
First-stage F-stat	195.6	195.6
P-Value of Difference	0.029	0.014
N	74,602	74,602
Panel C: IV estimates using income three calendar years prior		
Effect of income shock $(t-3)$ on women	-0.041*	-0.034
	(0.023)	(0.022)
Effect of income shock $(t-3)$ on men	-0.059**	-0.054**
	(0.024)	(0.023)
R-squared	0.005	0.093
First-stage F-stat	176.5	176.5
P-Value of Difference	0.204	0.158
N	49,497	49,497

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe is individuals who were 15-65 years old (inclusive). Household departure is a dummy for no longer being a member of the household (i.e., listed in the roster) despite being a member the previous year. See the notes from table 2 for descriptions of the income shock and control sets used. We consider income shocks experienced the previous calendar year (Panel A), two calendar years ago (Panel B), and three calendar years ago (Panel C). Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table 4: Effects of Income Shocks on Employment and Time Allocation, by Gender

	Share of a year that one's employed (1)	Hours: all employment (2)	Hours: home production (3)	Hours: other (4)
Panel A: IV estimates using income from the current calendar year				
Effect of income shock $(t-0)$ on women	-0.057***	-2.409***	0.719***	1.690**
	(0.017)	(0.705)	(0.130)	(0.704)
Effect of income shock $(t-0)$ on men	-0.007	-1.331*	0.453***	0.879
	(0.016)	(0.687)	(0.131)	(0.687)
R-squared	0.384	0.354	0.019	0.362
First-stage F-stat	172.2	172.1	172.1	172.1
P-Value of Difference	0.000	0.066	0.001	0.159
N	153,233	153,195	153,195	153,195
Panel B: IV estimates using income from the previous calendar year				
Effect of income shock $(t-1)$ on women	-0.039*	-0.691	0.036	0.655
	(0.022)	(0.874)	(0.163)	(0.875)
Effect of income shock $(t-1)$ on men	0.010	0.327	0.031	-0.358
	(0.020)	(0.851)	(0.158)	(0.851)
R-squared	0.396	0.366	0.028	0.372
First-stage F-stat	243.4	243.2	243.2	243.2
P-Value of Difference	0.003	0.155	0.958	0.150
N	113,610	113,576	113,576	113,576
Panel C: IV estimates using income two calendar years prior				
Effect of income shock $(t-2)$ on women	-0.060**	1.310	0.391**	-1.701*
	(0.024)	(0.990)	(0.181)	(0.992)
Effect of income shock $(t-2)$ on men	0.019	3.673***	0.534***	-4.207***
	(0.022)	(0.955)	(0.175)	(0.955)
R-squared	0.405	0.371	0.018	0.375
First-stage F-stat	177.9	178.0	178.0	178.0
P-Value of Difference	0.000	0.003	0.171	0.002
N	82,974	82,953	82,953	82,953

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe is individuals who were 15-65 years old (inclusive). Hours are the total per week, and the three categories of hours employment, home production, and other) are mutually exclusive and exhaustive by construction. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the income shock and control sets used. We consider income shocks experienced the current calendar year (Panel A), previous calendar year (Panel B), and two calendar years ago (Panel C). Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table 5: Effects of Income Shocks on Employment Choices, by Gender

	Dummy—worked multiple jobs in last week	Dummy—would like to work more, if it provided additional income	Dummy—student (universe: 15–25 years)
	(1)	(2)	(3)
Panel A: IV estimates using income from the current calendar year			
Effect of income shock $(t-0)$ on women	0.112***	-0.011	0.122***
	(0.022)	(0.028)	(0.032)
Effect of income shock $(t-0)$ on men	0.085***	-0.011	0.092***
	(0.021)	(0.027)	(0.031)
R-squared	0.033	0.043	0.379
First-stage F-stat	313.8	313.8	87.8
P-Value of Difference	0.071	0.998	0.230
N	100,638	100,638	46,617
Panel B: IV estimates using income from the previous calendar year			
Effect of income shock $(t-1)$ on women	0.106***	0.041	0.070*
	(0.027)	(0.033)	(0.041)
Effect of income shock $(t-1)$on men	0.069***	0.012	-0.021
	(0.026)	(0.032)	(0.040)
R-squared	0.035	0.040	0.388
First-stage F-stat	250.5	250.5	116.2
P-Value of Difference	0.032	0.117	0.002
N	75,277	75,277	34,293
Panel C: IV estimates using income two calendar years prior			
Effect of income shock $(t-2)$ on women	0.070**	-0.105***	-0.010
	(0.032)	(0.039)	(0.047)
Effect of income shock $(t-2)$ on men	0.043	-0.143***	-0.085*
	(0.032)	(0.039)	(0.047)
R-squared	0.039	0.029	0.393
First-stage F-stat	153.1	153.1	83.3
P-Value of Difference	0.131	0.054	0.022
N	55,089	55,089	25,026

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe for the outcomes in columns 1–2 is individuals who are 15-65 years old (inclusive) and employed in the current year. The universe for the outcome in column 3 is individuals who are 15-25 years old (inclusive). All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the income shock and control sets used. We consider income shocks experienced the current calendar year (Panel A), previous calendar year (Panel B), and two calendar years ago (Panel C). Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table 6: Effects of Income Shocks on Location of Employment by Gender

	Dummy—main place of work is...		
	... in the same oblast	... in another oblast	... in another country
	(1)	(2)	(3)
Panel A: IV estimates using income from current calendar year			
Effect of income shock ($t-0$) on women	0.017**	-0.016**	0.002
	(0.007)	(0.008)	(0.008)
Effect of income shock ($t-0$) on men	0.032***	-0.021***	0.001
	(0.008)	(0.008)	(0.008)
R-squared	0.007	0.006	0.019
First-stage F-stat	313.8	313.8	313.8
P-Value of Difference	0.004	0.347	0.827
N	100,638	100,638	100,638
Panel B: IV estimates using income from the previous calendar year			
Effect of income shock ($t-1$) on women	0.013	-0.014	0.017
	(0.011)	(0.011)	(0.012)
Effect of income shock ($t-1$)on men	0.020*	-0.017	0.018
	(0.010)	(0.011)	(0.012)
R-squared	0.012	0.008	0.020
First-stage F-stat	250.5	250.5	250.5
P-Value of Difference	0.261	0.540	0.972
N	75,277	75,277	75,277
Panel C: IV estimates using income two calendar years prior			
Effect of income shock ($t-2$) on women	0.019	-0.028**	0.018
	(0.014)	(0.014)	(0.016)
Effect of income shock ($t-2$) on men	0.027*	-0.032**	0.009
	(0.014)	(0.013)	(0.016)
R-squared	0.012	0.006	0.021
First-stage F-stat	153.1	153.1	153.1
P-Value of Difference	0.279	0.431	0.354
N	55,089	55,089	55,089

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe is individuals who are 15-65 years old (inclusive) and employed in the current year. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the income shock and control sets used. We consider income shocks experienced the current calendar year (Panel A), previous calendar year (Panel B), and two calendar years ago (Panel C). Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

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Appendix

The Gender Impacts of Income Fluctuations on Household departure and Employment Choices

Appendix A Appendix Tables

Table A1: Individual Household Departure and Labor Supply Outcomes, by Gender

	Women		Men	
	Mean (1)	N (2)	Mean (3)	N (4)
Dummy—individual left roster	0.08	56,896	0.10	48,259
Dummy—individual left roster for the first time in sample	0.08	56,186	0.09	46,607
Share of year with paid job and/or work on a family farm or enterprise	0.48	81,971	0.69	71,262
Weekly hours: all employment	16.34	81,960	25.57	71,235
Weekly hours: home production	1.14	81,960	1.15	71,235
Weekly hours: other	150.52	81,960	141.27	71,235
Dummy—worked multiple jobs in last week	0.10	46,624	0.15	54,014
Dummy—would like to work more, if it provided additional income	0.26	46,624	0.33	54,014
Dummy—main place of work is in the same oblast	0.98	46,624	0.97	54,014
Dummy—main place of work is in another oblast	0.02	46,624	0.03	54,014
Dummy—main place of work is outside the country	0.02	46,624	0.04	54,014
Dummy—student (universe: 15-25 years)	0.58	23,184	0.56	23,433

Source: Authors' calculations based on KIHS 2004–2016.

Notes: Outcomes are at the individual-year level. Hours of employment measures actual work hours (excluding lunch breaks, including overtime). Home production is the sum of time spent on the personal subsidiary plot, time spent on home preparation (firewood preparation, wild forest products, fishing, or processing of products harvested by members of your household, manufacturing wine and vodka products), and time spent on production of goods for sale or exchange, or on delivery of services. Other time is calculated as total weekly hours (24×7) minus total employment hours and minus home production hours. The universe for the household departure and employment outcomes are individuals who are between 15 and 65 years old (inclusive).

Table A2: Individual Characteristics by Whether or not the Individual Departed the Household Permanently at Any Point

	Departed		Did not depart		Difference		
	Mean	SE	Mean	SE	Mean	SE	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	27.28	(11.83)	38.43	(13.32)	-11.15***	(0.16)	33,625
Dummy—male	0.51	(0.50)	0.44	(0.50)	0.07***	(0.01)	33,625
Dummy—married	0.40	(0.49)	0.71	(0.45)	-0.31***	(0.01)	33,625
Dummy—has a "general secondary degree" or higher	0.75	(0.43)	0.88	(0.32)	-0.13***	(0.00)	33,625
Relationship to head: head	0.15	(0.36)	0.39	(0.49)	-0.24***	(0.01)	33,625
Relationship to head: spouse	0.07	(0.26)	0.29	(0.46)	-0.22***	(0.01)	33,625
Relationship to head: son/daughter	0.58	(0.49)	0.21	(0.41)	0.36***	(0.01)	33,625
Relationship to head: son/daughter-in-law	0.11	(0.31)	0.08	(0.27)	0.03***	(0.00)	33,625
Relationship to head: other	0.09	(0.29)	0.03	(0.16)	0.06***	(0.00)	33,625

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe is individuals 15-65 years old (inclusive). Individual departure from the household is an indicator variable for leaving the household roster at some point in our sample. All measures are taken from the year that the individual enters the sample, and we retain only this one, baseline observation per person. Standard errors are in parentheses and clustered at the household level. *** indicates $p<0.01$; ** indicates $p<0.05$; and * indicates $p<0.10$.

Table A3: Effects of Income Shocks on First Household Departure

	(1)	(2)
	Dummy—departure from the household	
Controls added iteratively		
Household and year fixed effects	X	X
Baseline income variables interacted with time trend	X	X
Individual controls		X
Panel A: IV estimates using income from the previous calendar year		
Effect of income shock $(t-1)$ on women	-0.046**	-0.032*
	(0.019)	(0.018)
Effect of income shock $(t-1)$ on men	-0.054***	-0.041**
	(0.019)	(0.018)
R-squared	0.003	0.090
First-stage F-stat	276.7	278.6
P-Value of Difference	0.536	0.446
N	102,793	102,793
Panel B: IV estimates using income two calendar years prior		
Effect of income shock $(t-2)$ on women	-0.033	-0.028
	(0.023)	(0.021)
Effect of income shock $(t-2)$ on men	-0.070***	-0.063***
	(0.023)	(0.022)
R-squared	0.000	0.087
First-stage F-stat	191.8	191.7
P-Value of Difference	0.005	0.006
N	72,239	72,239
Panel C: IV estimates using income three calendar years prior		
Effect of income shock $(t-3)$ on women	-0.048**	-0.041*
	(0.022)	(0.021)
Effect of income shock $(t-3)$ on men	-0.072***	-0.064***
	(0.023)	(0.022)
R-squared	0.002	0.088
First-stage F-stat	168.6	168.6
P-Value of Difference	0.089	0.098
N	47,088	47,088

Source: Authors' calculations based on KIHS 2004–2016.

Notes: The universe is individuals who were 15-65 years old (inclusive). Household departure is a dummy for no longer being a member of the household (i.e., listed in the roster) despite being a member the previous year; it takes on a value of 0 if one remains a household member. It takes on a missing value if the individual was not a household member the previous year (i.e., is new to the household in the current year) or any year after the outcome takes on a value of 1—thus considering only the first move of any individual that returned to the household and departed again. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. We consider income shocks experienced the previous calendar year (Panel A), two calendar years ago (Panel B), and three calendar years ago (Panel C). See the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A4: Household-level Summary Statistics on Baseline Share of Household Income (or Share of Household Agricultural Production Costs) Coming from Different Sources

	Mean	p10	p50	p90	SD	N
Panel A: Non-agricultural Income Sources						
Transfers from government	0.133	0.000	0.000	0.190	0.224	14,934
Transfers from individuals	0.063	0.000	0.000	0.048	0.151	14,934
Other income	0.019	0.002	0.004	0.008	0.084	14,934
Income from self-employment	0.151	0.000	0.000	0.193	0.271	14,934
Income from wage employment	0.416	0.000	0.361	0.750	0.366	14,934
Panel B: Agriculture Income Sources						
Income from livestock	0.028	0.000	0.000	0.000	0.085	14,934
Income from meat production	0.044	0.000	0.000	0.035	0.100	14,934
Income from food processing	0.015	0.000	0.000	0.009	0.041	14,934
Income from harvested crops	0.132	0.000	0.004	0.182	0.221	14,934
Panel C: Agricultural Cost Sources						
Crop production cost	0.560	0.051	0.672	1.000	0.423	7,279
Livestock cost	0.440	0.000	0.328	0.949	0.423	7,279

Source: Authors' calculations based on KIHS 2004–2016.

Notes: Statistics are based on the initial year a household appeared in the sample (which is the year for which we compute shares for the purpose of constructing the Bartik instrument). Income shares (Panels A and B) were calculated using data on revenues from each of the 9 sectors. Cost shares (Panel C) were calculated using data on costs from each of the 2 sectors that have costs (crops and livestock)—where much of the sample has 0 values for both sectors and thus does not appear in Panel C.

Table A5: Effects of Income Shocks on Household Departure, Household-level Regressions

	Dummy—having ... depart from household		
	... a member	... a female member	... a male member
	(1)	(2)	(3)
Panel A: IV, using income from the previous calendar year			
Effect of income shock $(t-1)$	-0.112***	-0.030	-0.109***
	(0.035)	(0.028)	(0.029)
R-squared	0.001	0.008	-0.011
First-stage F-stat	566.4	566.4	566.4
N	42,561	42,561	42,561
Panel B: IV, using income two calendar years prior			
Effect of income shock $(t-2)$	-0.091**	-0.025	-0.066*
	(0.042)	(0.032)	(0.034)
R-squared	0.003	0.005	-0.001
First-stage F-stat	406.4	406.4	406.4
N	30,624	30,624	30,624
Panel C: IV, using income three calendar years prior			
Effect of income shock $(t-3)$	-0.098**	-0.056	-0.067*
	(0.045)	(0.035)	(0.036)
R-squared	0.012	0.006	0.006
First-stage F-stat	317.8	317.8	317.8
N	17,877	17,877	17,877

Source: Authors' calculations based on KIHS 2004–2016.

Notes: An observation is a household–year. The outcomes take a missing value in the first year in which a household appears in the sample and then take on either a value of 0 or 1 in the subsequent years. They take on a 1 if any household member leaves the household since the previous round (i.e., is no longer listed on the household roster), and 0 otherwise. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. We consider income shocks experienced the previous calendar year (Panel A), two calendar years ago (Panel B), and three calendar years ago (Panel C). All regressions include household and year fixed effects and baseline income variables interacted with a time trend; see the notes from table 2 for descriptions of the control sets. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A6: Effects of Income Shocks on Household Reliance on Agricultural Income

	Agricultural revenue over total HH income	Agricultural profit (revenue net of costs) over total net HH income	Dummy—HH has any agricultural income
	(1)	(2)	(3)
Panel A: IV, using income from current calendar year			
Effect of income shock ($t-0$)	0.177***	0.200***	0.054***
	(0.015)	(0.016)	(0.021)
R-squared	-0.036	-0.038	0.028
First-stage F-stat	269.2	269.2	269.2
N	42,676	42,676	42,676
Panel B: IV, using income from the previous calendar years			
Effect of income shock ($t-1$)	0.061***	0.075***	-0.012
	(0.015)	(0.016)	(0.024)
R-squared	0.021	-0.001	0.020
First-stage F-stat	566.4	563.6	566.4
N	42,561	42,551	42,561
Panel C: IV, using income two calendar years prior			
Effect of income shock ($t-2$)	-0.002	0.000	0.040
	(0.015)	(0.016)	(0.027)
R-squared	0.062	0.048	0.023
First-stage F-stat	406.4	405.1	406.4
N	30,624	30,614	30,624

Source: Authors' calculations based on KIHS 2004–2016.

Notes: An observation is a household–year. We constructed three outcomes that relate to household transition to agricultural production. Agricultural revenue over total household income in column 1 is total revenue from four agricultural income sources (crop production, livestock sales, meat production, and processed food production) as a share of total household income (ignoring agricultural production costs—making it distinct from total household net income). Agricultural profit (revenue net of costs) over total household net income in column 2 is total profit from agricultural sources (four agricultural income sources minus two agricultural costs) as a share of total household *net* income (total household income minus total household costs). The column 3 outcome is an indicator for a household having any agricultural revenue (from any of the four sources). Column 2 omits 10 observations of individuals with negative net incomes. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. We consider income shocks experienced the current calendar year (Panel A), previous calendar year (Panel B), and two calendar years ago (Panel C). All regressions include household and year fixed effects and baseline income variables interacted with a time trend; see the notes from table 2 for descriptions of the control sets. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A7: Effects of Income Fluctuations on Main Outcomes by Urbanization Status

Outcome	Lag	Urban Only						Rural Only						Rural vs. Urban	
		Women		Men				Women		Men				Women	Men
		Coef. (1)	S.E (2)	Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	Coef. (6)	S.E (7)	Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)	P-value (1)=(6)	P-value (3)=(8)
Dummy—departure from household	1	-0.024	(0.035)	-0.052	(0.035)	41.3	0.137	-0.038*	(0.022)	-0.044*	(0.023)	41.3	0.710	0.728	0.852
Dummy—departure from household	2	-0.064	(0.043)	-0.081*	(0.044)	29.8	0.378	-0.003	(0.029)	-0.044	(0.029)	29.8	0.014	0.244	0.480
Dummy—departure from household	3	0.006	(0.047)	0.013	(0.048)	28.1	0.768	-0.038	(0.027)	-0.074***	(0.028)	28.1	0.037	0.415	0.118
Share of a year that one's employed	0	-0.049	(0.032)	-0.023	(0.030)	33.9	0.274	-0.058***	(0.021)	0.011	(0.019)	33.9	0.000	0.811	0.348
Share of a year that one's employed	1	-0.056	(0.044)	-0.002	(0.042)	35.5	0.078	-0.021	(0.026)	0.027	(0.024)	35.5	0.012	0.493	0.550
Share of a year that one's employed	2	-0.097**	(0.046)	0.010	(0.043)	22.9	0.002	-0.017	(0.029)	0.044	(0.027)	22.9	0.004	0.141	0.508
Hours: all employment	0	-2.227	(1.375)	-1.918	(1.332)	33.9	0.770	-1.466*	(0.786)	0.078	(0.777)	33.9	0.017	0.631	0.196
Hours: all employment	1	-1.341	(1.878)	-0.380	(1.813)	35.5	0.475	0.643	(0.970)	1.670*	(0.953)	35.5	0.186	0.348	0.317
Hours: all employment	2	-0.092	(2.074)	2.730	(1.973)	22.9	0.059	3.616***	(1.139)	5.524***	(1.125)	22.9	0.033	0.117	0.219
Hours: home production	0	0.783***	(0.180)	0.800***	(0.170)	33.9	0.847	0.911***	(0.189)	0.431**	(0.191)	33.9	0.000	0.622	0.148
Hours: home production	1	0.247	(0.218)	0.189	(0.220)	35.5	0.624	-0.012	(0.228)	-0.008	(0.218)	35.5	0.978	0.411	0.524
Hours: home production	2	0.665***	(0.234)	0.541**	(0.231)	22.9	0.294	0.128	(0.265)	0.424*	(0.256)	22.9	0.050	0.129	0.735
Hours: other	0	1.444	(1.356)	1.118	(1.317)	33.9	0.756	0.555	(0.794)	-0.508	(0.785)	33.9	0.092	0.572	0.289
Hours: other	1	1.094	(1.883)	0.191	(1.818)	35.5	0.499	-0.630	(0.968)	-1.661*	(0.951)	35.5	0.170	0.415	0.367
Hours: other	2	-0.572	(2.079)	-3.271*	(1.984)	22.9	0.070	-3.743***	(1.140)	-5.948***	(1.120)	22.9	0.012	0.181	0.240
Dummy—worked multiple jobs	0	0.068**	(0.027)	0.055**	(0.026)	49	0.402	0.119***	(0.030)	0.110***	(0.030)	49	0.706	0.218	0.157
Dummy—worked multiple jobs	1	0.066*	(0.039)	0.073**	(0.037)	30.9	0.743	0.137***	(0.036)	0.098***	(0.035)	30.9	0.096	0.183	0.628
Dummy—worked multiple jobs	2	0.109**	(0.047)	0.113**	(0.047)	18.3	0.851	0.080*	(0.044)	0.052	(0.044)	18.3	0.277	0.644	0.340
Dummy—would like to work more	0	0.196***	(0.050)	0.166***	(0.048)	49	0.248	-0.130***	(0.034)	-0.103***	(0.033)	49	0.189	0.000	0.000
Dummy—would like to work more	1	0.194**	(0.076)	0.146**	(0.072)	30.9	0.116	-0.018	(0.036)	-0.032	(0.036)	30.9	0.528	0.012	0.026
Dummy—would like to work more	2	-0.124	(0.089)	-0.148*	(0.086)	18.3	0.444	-0.048	(0.045)	-0.089**	(0.045)	18.3	0.105	0.445	0.536
Dummy—student (15–25 years)	0	0.109**	(0.054)	0.077	(0.054)	27	0.417	0.117***	(0.039)	0.102***	(0.038)	27	0.628	0.904	0.707
Dummy—student (15–25 years)	1	0.122	(0.079)	0.019	(0.078)	18.7	0.033	0.030	(0.048)	-0.033	(0.049)	18.7	0.070	0.321	0.572
Dummy—student (15–25 years)	2	-0.021	(0.084)	-0.079	(0.082)	11.1	0.305	-0.009	(0.058)	-0.075	(0.060)	11.1	0.070	0.905	0.971
Dummy—work in the same oblast	0	0.002	(0.011)	0.027**	(0.013)	49	0.009	0.026***	(0.009)	0.037***	(0.010)	49	0.073	0.101	0.552
Dummy—work in the same oblast	1	-0.018	(0.021)	-0.002	(0.020)	30.9	0.168	0.027**	(0.013)	0.031**	(0.013)	30.9	0.640	0.069	0.175
Dummy—work in the same oblast	2	-0.024	(0.026)	0.005	(0.028)	18.3	0.030	0.045**	(0.019)	0.043**	(0.019)	18.3	0.822	0.032	0.259
Dummy—work in another oblast	0	-0.004	(0.010)	-0.014	(0.012)	49	0.181	-0.028***	(0.010)	-0.028***	(0.011)	49	0.919	0.093	0.386
Dummy—work in another oblast	1	-0.000	(0.018)	-0.008	(0.018)	30.9	0.290	-0.027**	(0.014)	-0.026*	(0.014)	30.9	0.940	0.243	0.425
Dummy—work in another oblast	2	-0.002	(0.021)	-0.020	(0.020)	18.3	0.053	-0.051***	(0.019)	-0.048**	(0.019)	18.3	0.736	0.086	0.304
Dummy—work in another country	0	0.019	(0.014)	0.009	(0.015)	49	0.343	-0.009	(0.010)	-0.007	(0.010)	49	0.743	0.103	0.402
Dummy—work in another country	1	0.030	(0.025)	0.021	(0.025)	30.9	0.535	0.009	(0.014)	0.013	(0.015)	30.9	0.667	0.470	0.781
Dummy—work in another country	2	0.056*	(0.031)	0.046	(0.031)	18.3	0.532	0.006	(0.020)	-0.004	(0.019)	18.3	0.431	0.169	0.176

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check how the results appearing in tables 3 – 6 look when separately examining rural (columns 1–4) and urban (columns 6–9) households; the universe of individuals included in the regressions, outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table for which they further disaggregate the sample into urban and rural. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A8: Effects of Income Fluctuations on Main Outcomes by Whether Household Earned the Majority of it Income from Agriculture at Baseline

Outcome	Lag	Households with ... of total income from agriculture in base year: >=50%						<50%						HHs with >=50% vs. <50% agricultural income	
		Women		Men				Women		Men				Women	Men
		Coef. (1)	S.E (2)	Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	Coef. (6)	S.E (7)	Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)	P-value (1)=(6)	P-value (3)=(8)
Dummy—departure from household	1	-0.041	(0.028)	-0.042	(0.030)	66.1	0.966	-0.016	(0.025)	-0.040	(0.026)	66.1	0.103	0.501	0.965
Dummy—departure from household	2	-0.017	(0.035)	-0.048	(0.036)	59.2	0.149	-0.034	(0.031)	-0.068**	(0.031)	59.2	0.031	0.721	0.673
Dummy—departure from household	3	-0.068*	(0.036)	-0.101***	(0.037)	50.3	0.147	-0.012	(0.030)	-0.025	(0.031)	50.3	0.450	0.229	0.117
Share of a year that one's employed	0	-0.034	(0.024)	0.048**	(0.022)	32.6	0.000	-0.072***	(0.025)	-0.037	(0.023)	32.6	0.051	0.272	0.009
Share of a year that one's employed	1	0.028	(0.031)	0.030	(0.028)	55.9	0.915	-0.088***	(0.031)	-0.013	(0.030)	55.9	0.001	0.009	0.291
Share of a year that one's employed	2	0.065*	(0.035)	0.051	(0.032)	53.5	0.636	-0.112***	(0.032)	0.014	(0.030)	53.5	0.000	0.000	0.403
Hours: all employment	0	-1.886**	(0.902)	-0.616	(0.889)	32.6	0.123	-2.457**	(1.043)	-1.615	(1.012)	32.6	0.277	0.679	0.458
Hours: all employment	1	-0.574	(1.128)	-0.776	(1.134)	55.9	0.838	-0.688	(1.288)	0.932	(1.248)	55.9	0.089	0.947	0.311
Hours: all employment	2	4.652***	(1.396)	4.576***	(1.339)	53.5	0.949	0.073	(1.360)	3.553***	(1.320)	53.5	0.001	0.019	0.587
Hours: home production	0	1.241***	(0.224)	0.464**	(0.236)	32.6	0.000	0.626***	(0.171)	0.637***	(0.167)	32.6	0.901	0.029	0.549
Hours: home production	1	0.255	(0.284)	-0.100	(0.271)	55.9	0.070	0.146	(0.211)	0.333	(0.206)	55.9	0.075	0.757	0.203
Hours: home production	2	-0.186	(0.330)	0.057	(0.316)	53.5	0.259	0.860***	(0.219)	0.958***	(0.216)	53.5	0.373	0.008	0.019
Hours: other	0	0.645	(0.907)	0.152	(0.898)	32.6	0.541	1.832*	(1.033)	0.979	(1.001)	32.6	0.262	0.388	0.539
Hours: other	1	0.319	(1.126)	0.876	(1.131)	55.9	0.562	0.542	(1.285)	-1.265	(1.246)	55.9	0.055	0.896	0.203
Hours: other	2	-4.466***	(1.375)	-4.633***	(1.308)	53.5	0.886	-0.932	(1.375)	-4.512***	(1.334)	53.5	0.001	0.069	0.948
Dummy—worked multiple jobs	0	0.120***	(0.037)	0.094***	(0.035)	69.1	0.329	0.049*	(0.026)	0.039	(0.025)	69.1	0.578	0.110	0.204
Dummy—worked multiple jobs	1	0.079*	(0.046)	0.009	(0.044)	63.2	0.020	0.085**	(0.035)	0.078**	(0.034)	63.2	0.711	0.918	0.212
Dummy—worked multiple jobs	2	0.088	(0.057)	0.019	(0.056)	48.3	0.044	0.031	(0.039)	0.030	(0.038)	48.3	0.947	0.408	0.872
Dummy—would like to work more	0	-0.154***	(0.041)	-0.139***	(0.039)	69.1	0.553	0.155***	(0.039)	0.155***	(0.038)	69.1	0.995	0.000	0.000
Dummy—would like to work more	1	-0.020	(0.043)	-0.072*	(0.044)	63.2	0.073	0.112**	(0.051)	0.101**	(0.050)	63.2	0.639	0.047	0.009
Dummy—would like to work more	2	0.049	(0.050)	-0.062	(0.052)	48.3	0.001	-0.146**	(0.057)	-0.142**	(0.055)	48.3	0.856	0.010	0.294
Dummy—student (15–25 years)	0	0.097**	(0.045)	0.060	(0.047)	19.9	0.350	0.143***	(0.045)	0.121***	(0.042)	19.9	0.476	0.470	0.330
Dummy—student (15–25 years)	1	0.052	(0.059)	-0.064	(0.059)	29.9	0.011	0.089	(0.055)	0.016	(0.054)	29.9	0.041	0.647	0.324
Dummy—student (15–25 years)	2	-0.001	(0.066)	-0.062	(0.067)	25.6	0.198	-0.057	(0.064)	-0.133**	(0.065)	25.6	0.066	0.541	0.447
Dummy—work in the same oblast	0	0.018**	(0.009)	0.021**	(0.009)	69.1	0.636	0.018	(0.011)	0.043***	(0.012)	69.1	0.001	0.969	0.138
Dummy—work in the same oblast	1	0.032**	(0.015)	0.022	(0.015)	63.2	0.123	-0.004	(0.016)	0.016	(0.016)	63.2	0.038	0.104	0.788
Dummy—work in the same oblast	2	0.054**	(0.023)	0.050**	(0.022)	48.3	0.666	-0.005	(0.020)	0.012	(0.020)	48.3	0.108	0.055	0.212
Dummy—work in another oblast	0	-0.020*	(0.011)	-0.019	(0.012)	69.1	0.896	-0.011	(0.010)	-0.020*	(0.011)	69.1	0.179	0.564	0.945
Dummy—work in another oblast	1	-0.019	(0.017)	-0.017	(0.019)	63.2	0.737	-0.003	(0.015)	-0.010	(0.015)	63.2	0.362	0.458	0.765
Dummy—work in another oblast	2	-0.042*	(0.023)	-0.040*	(0.023)	48.3	0.789	-0.018	(0.017)	-0.027	(0.017)	48.3	0.286	0.402	0.650
Dummy—work in another country	0	-0.001	(0.009)	0.013	(0.011)	69.1	0.053	-0.001	(0.012)	-0.015	(0.013)	69.1	0.114	0.990	0.104
Dummy—work in another country	1	-0.023	(0.015)	0.003	(0.017)	63.2	0.005	0.041**	(0.019)	0.022	(0.020)	63.2	0.086	0.009	0.456
Dummy—work in another country	2	-0.007	(0.024)	-0.008	(0.023)	48.3	0.972	0.034	(0.022)	0.020	(0.023)	48.3	0.215	0.201	0.393

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check how the results appearing in tables 3 – 6 look when separately examining households with half or more of net household income coming from agriculture at baseline (columns 1–4) and less than half (columns 6–9); the universe of individuals included in the regressions, outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table for which they further disaggregate the sample into lower vs. higher baseline reliance on agriculture as a source of income. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A9: Effects of Income Fluctuations on Main Outcomes by Whether Household Earned Income from Agriculture at Baseline

Outcome	Lag	Household ... agricultural income in base year: has — Women Coef. (1)	S.E (2)	Men Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	does not have — Women Coef. (6)	S.E (7)	Men Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)	HH has vs. does not have agricultural income — Women P-value (1)=(6)	Men P-value (3)=(8)
Dummy—departure from household	1	-0.037*	(0.021)	-0.046**	(0.021)	24.7	0.503	-0.027	(0.044)	-0.065	(0.044)	24.7	0.120	0.840	0.693
Dummy—departure from household	2	-0.013	(0.025)	-0.049*	(0.026)	19.9	0.011	-0.080	(0.061)	-0.098	(0.062)	19.9	0.534	0.309	0.468
Dummy—departure from household	3	-0.050**	(0.024)	-0.074***	(0.025)	11.9	0.114	0.130*	(0.071)	0.125*	(0.070)	11.9	0.863	0.015	0.007
Share of a year that one's employed	0	-0.054***	(0.018)	-0.002	(0.017)	11.5	0.000	-0.052	(0.051)	-0.001	(0.047)	11.5	0.135	0.974	0.989
Share of a year that one's employed	1	-0.028	(0.024)	0.013	(0.022)	22.1	0.023	-0.096	(0.060)	-0.010	(0.058)	22.1	0.039	0.291	0.713
Share of a year that one's employed	2	-0.042	(0.026)	0.029	(0.024)	17.5	0.000	-0.105	(0.067)	0.007	(0.063)	17.5	0.013	0.378	0.741
Hours: all employment	0	-1.850**	(0.726)	-0.928	(0.720)	11.5	0.140	-3.465	(2.280)	-1.617	(2.122)	11.5	0.212	0.500	0.758
Hours: all employment	1	-0.463	(0.946)	0.316	(0.922)	22.1	0.303	-0.704	(2.547)	1.320	(2.525)	22.1	0.271	0.929	0.709
Hours: all employment	2	1.813*	(1.067)	4.094***	(1.042)	17.5	0.008	1.655	(3.027)	4.235	(2.876)	17.5	0.204	0.961	0.963
Hours: home production	0	0.954***	(0.157)	0.605***	(0.161)	11.5	0.001	0.249**	(0.118)	0.303***	(0.112)	11.5	0.316	0.000	0.122
Hours: home production	1	0.074	(0.199)	0.062	(0.192)	22.1	0.925	0.436**	(0.173)	0.421***	(0.163)	22.1	0.832	0.170	0.154
Hours: home production	2	0.331	(0.221)	0.510**	(0.213)	17.5	0.167	0.690***	(0.195)	0.660***	(0.188)	17.5	0.701	0.223	0.599
Hours: other	0	0.897	(0.725)	0.323	(0.719)	11.5	0.349	3.216	(2.270)	1.315	(2.112)	11.5	0.197	0.330	0.657
Hours: other	1	0.389	(0.945)	-0.378	(0.920)	22.1	0.299	0.268	(2.541)	-1.741	(2.515)	22.1	0.273	0.964	0.611
Hours: other	2	-2.144**	(1.068)	-4.604***	(1.040)	17.5	0.003	-2.345	(3.034)	-4.895*	(2.881)	17.5	0.208	0.950	0.924
Dummy—worked multiple jobs	0	0.122***	(0.026)	0.104***	(0.025)	27.1	0.310	0.034	(0.027)	0.023	(0.024)	27.1	0.547	0.018	0.020
Dummy—worked multiple jobs	1	0.121***	(0.032)	0.083***	(0.031)	24.2	0.061	0.035	(0.039)	0.042	(0.038)	24.2	0.733	0.087	0.410
Dummy—worked multiple jobs	2	0.069*	(0.038)	0.042	(0.038)	14.9	0.217	0.081	(0.058)	0.082	(0.055)	14.9	0.954	0.861	0.548
Dummy—would like to work more	0	-0.043	(0.031)	-0.044	(0.030)	27.1	0.977	0.152**	(0.068)	0.177***	(0.065)	27.1	0.484	0.009	0.002
Dummy—would like to work more	1	0.022	(0.035)	-0.013	(0.035)	24.2	0.083	0.137	(0.106)	0.153	(0.099)	24.2	0.713	0.301	0.117
Dummy—would like to work more	2	-0.072*	(0.040)	-0.113***	(0.041)	14.9	0.072	-0.203	(0.148)	-0.232	(0.142)	14.9	0.518	0.394	0.420
Dummy—student (15–25 years)	0	0.132***	(0.035)	0.104***	(0.035)	13	0.322	0.090	(0.077)	0.058	(0.072)	13	0.520	0.623	0.563
Dummy—student (15–25 years)	1	0.044	(0.046)	-0.030	(0.045)	11.5	0.024	0.158	(0.102)	0.036	(0.100)	11.5	0.052	0.305	0.544
Dummy—student (15–25 years)	2	-0.007	(0.052)	-0.072	(0.052)	7.6	0.064	-0.187	(0.136)	-0.282**	(0.140)	7.6	0.194	0.217	0.162
Dummy—work in the same oblast	0	0.019**	(0.008)	0.034***	(0.008)	27.1	0.006	0.017	(0.016)	0.031	(0.020)	27.1	0.304	0.902	0.865
Dummy—work in the same oblast	1	0.013	(0.012)	0.018	(0.012)	24.2	0.409	0.015	(0.025)	0.030	(0.028)	24.2	0.417	0.947	0.686
Dummy—work in the same oblast	2	0.022	(0.016)	0.024	(0.016)	14.9	0.776	0.017	(0.037)	0.053	(0.041)	14.9	0.121	0.903	0.512
Dummy—work in another oblast	0	-0.021**	(0.008)	-0.022**	(0.009)	27.1	0.766	-0.001	(0.018)	-0.015	(0.020)	27.1	0.237	0.313	0.745
Dummy—work in another oblast	1	-0.023*	(0.012)	-0.021*	(0.013)	24.2	0.804	0.023	(0.029)	-0.001	(0.028)	24.2	0.079	0.147	0.508
Dummy—work in another oblast	2	-0.036**	(0.015)	-0.034**	(0.015)	14.9	0.744	-0.004	(0.041)	-0.042	(0.040)	14.9	0.021	0.469	0.848
Dummy—work in another country	0	0.004	(0.009)	0.001	(0.009)	27.1	0.632	-0.013	(0.017)	-0.002	(0.020)	27.1	0.397	0.364	0.900
Dummy—work in another country	1	0.026*	(0.013)	0.022	(0.014)	24.2	0.678	-0.021	(0.028)	0.001	(0.031)	24.2	0.241	0.132	0.536
Dummy—work in another country	2	0.021	(0.018)	0.008	(0.017)	14.9	0.199	0.023	(0.037)	0.042	(0.044)	14.9	0.386	0.969	0.475

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check how the results appearing in tables 3 – 6 look when separately examining households earning income from agriculture at baseline (columns 1–4) or not (columns 6–9); the universe of individuals included in the regressions, outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table for which they further disaggregate the sample into lower vs. higher baseline reliance on agriculture as a source of income. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A10: Summary of Rotemberg Weights

Panel A: Negative and positive weights

	Sum	Mean	Share
Negative	-0.218	-0.055	0.152
Positive	1.218	0.244	0.848

Panel B: Correlations of Sector Aggregates

	α_k	g_k	$\hat{\beta}_k$	F_k	Var(z_k)
α_k	1				
g_k	0.202	1			
$\hat{\beta}_k$	0.167	0.174	1		
F_k	0.746	-0.121	0.328	1	
Var(z_k)	0.093	-0.451	-0.139	0.346	1

Panel C: Variation across years in α_k

	Sum	Mean
2005	0.033	0.004
2006	0.359	0.040
2007	0.428	0.048
2008	0.180	0.020

Panel D: Rotemberg weights by income sector

	$\hat{\alpha}_k$	g_k	$\hat{\beta}_k$
Agri, income from harvested crops	0.828	1.308	0.003
Agri, income from food processing	0.161	8.128	-0.022
Agri, income from livestock	0.213	2.305	-0.017
Agri, income from meat production	0.014	0.313	-0.035
Non-agri, other income	-0.002	0.662	-0.048
Non-agri, transfer from government	-0.039	0.224	0.008
Non-agri, income from self-employment	0.003	0.222	-0.493
Non-agri, transfer from individual	-0.135	0.686	-0.032
Non-agri, income from wage	-0.043	0.368	0.037

Panel E: Estimates of $\hat{\beta}_k$ for positive and negative weights

	α-weighted Sum	Share of overall β	Mean
Negative	0.003	-0.666	-0.009
Positive	-0.006	1.666	-0.113

Notes: Rotemberg weights are constructed using the departure from household outcome from table 3. To obtain a balanced panel, we replaced its missing values to 0, kept only households that entered our sample in 2004, retained four years of data (2005–2008) for each (the median household is in the sample for four years), and kept only households with non-missing data for all four years. The total number of observations used to construct the Rotemberg weights is 28,636. Current year logged endogenous (actual) income (total income from the 9 sectors) is used to estimate the Rotemberg weights. This table reports statistics about the Rotemberg weights. We report statistics about the aggregated weights (aggregate a given sector across years). Panel A reports the share and sum of negative Rotemberg weights. Panel B shows the correlation between the Rotemberg weights (α_k), the national income growth rate (g_k), the just-identified coefficient estimates ($\hat{\beta}_k$), the first-stage F-statistic of the sector share (F_k), and the variation in the sector shares across locations (Var(z_k)). Panel C reports the Rotemberg weights by income source.

Table A11: Baseline correlation between income sector share and household demographic characteristics

	(1) Agri. income from harvested crops	(2) Agri. income from livestock	(3) Agri. income from food processing
Number of member younger than 15 years old	0.0240***	0.00644***	0.00195***
	(0.00238)	(0.00119)	(0.000501)
Number of member age 15 - 65 (inclusive)	0.0196***	0.0101***	0.000830**
	(0.00239)	(0.00124)	(0.000409)
Number of member older than 64 years old	0.00729	0.0134***	0.00128
	(0.00652)	(0.00406)	(0.00127)
Head of household			
Age	0.000482*	0.000106	0.0000207
	(0.000251)	(0.000144)	(0.0000461)
Male	0.0403***	0.0103**	0.00172
	(0.00913)	(0.00459)	(0.00146)
Married	-0.00644	-0.00449	0.00248*
	(0.00940)	(0.00484)	(0.00143)
Completed general secondary education	-0.0241***	-0.00428	-0.00551***
	(0.00901)	(0.00506)	(0.00169)
Observations	4,619	4,619	4,619
R^2	0.074	0.040	0.014

Source: Authors' calculations based on KIHS 2004–2016.
Notes: We only used households that entered in 2004 for this analysis. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A12: Correlations Between Changes in Outcome During 2005-2008 and Household Characteristics Correlated with Sector Shares with Highest Rotemberg Weights

	(1) Departure from household	(2) Share of a year that one's employed	(3) Hours: all employ-ment	(4) Hours: home production	(5) Hours: other
Number of membesr younger than 15 years old	0.00643**	-0.00736**	-0.204	-0.0990***	0.303*
	(0.00250)	(0.00357)	(0.160)	(0.0320)	(0.160)
Number of members age 15 - 65 (inclusive)	0.0410***	0.000918	-0.141	0.0170	0.124
	(0.00250)	(0.00403)	(0.179)	(0.0310)	(0.177)
Number of members older than 64 years old	0.0219**	0.0119	0.318	0.0266	-0.344
	(0.00908)	(0.0148)	(0.658)	(0.137)	(0.664)
Head of household					
Age	-0.000212	-0.00176***	-0.0496*	-0.00377	0.0534**
	(0.000346)	(0.000603)	(0.0266)	(0.00528)	(0.0266)
Male	-0.0348***	-0.00924	-1.068	-0.502***	1.570*
	(0.0126)	(0.0194)	(0.930)	(0.155)	(0.921)
Married	-0.0162	-0.00280	0.552	0.414**	-0.966
	(0.0133)	(0.0208)	(0.985)	(0.172)	(0.980)
Completed general secondary education	0.0119	-0.0157	-0.290	-0.160	0.449
	(0.0112)	(0.0178)	(0.799)	(0.138)	(0.796)
Observations	15,008	7,307	7,304	7,304	7,304
R^2	0.023	0.002	0.001	0.003	0.002

Source: Authors' calculations based on KIHS 2004–2016.

Notes: We only used households that entered in 2004 for this analysis. Change in departure from household is 1 if individual departed from household in any given year in 2006, 2007, and 2008, and it is 0 otherwise. Changes in outcomes are calculated using values in year 2008 minus values in year 2005 for column (2) - (5). We only compare the same individuals to themselves, so if an individual is not measured in both years, they are not included in this regression. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A13: Robustness of Effects of Income Fluctuations on Main Outcomes to Accounting for Large Income Shocks

Outcome	Lag	Indicator for large shock to income in year $t = 1$ if the absolute value of the % change in income relative to the HH median in year t is $\geqslant 50\%$																	
		Control for large shock indicator						Control for large shock indicator, instrumented with predicted large shock indicator						Exclude HHs that experienced a large shock					
		Women		Men				Women		Men				Women		Men			
		Coef. (1)	S.E (2)	Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	Coef. (6)	S.E (7)	Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)	Coef. (11)	S.E (12)	Coef. (13)	S.E (14)	F-stat (15)	P-value (11)=(13)
Dummy—departure from household	1	-0.031*	(0.018)	-0.043**	(0.018)	307	0.269	-0.026	(0.019)	-0.049**	(0.020)	28.1	0.172	-0.049*	(0.035)	-0.087**	(0.035)	236.1	0.113
Dummy—departure from household	2	-0.023	(0.022)	-0.053**	(0.022)	224.5	0.011	-0.028	(0.023)	-0.047*	(0.026)	21.6	0.410	-0.004	(0.044)	-0.085*	(0.045)	131.4	0.001
Dummy—departure from household	3	-0.034	(0.022)	-0.053**	(0.022)	198.3	0.169	-0.041*	(0.024)	-0.033	(0.027)	18.3	0.764	-0.082*	(0.052)	-0.107**	(0.053)	86.9	0.382
Share of a year that one's employed	0	-0.059***	(0.018)	-0.012	(0.017)	165.8	0.001	-0.046**	(0.018)	-0.009	(0.017)	40.8	0.008	-0.130***	(0.036)	-0.048	(0.036)	255.7	0.010
Share of a year that one's employed	1	-0.036	(0.022)	0.006	(0.020)	275.6	0.008	-0.027	(0.023)	-0.005	(0.022)	27.9	0.329	-0.053*	(0.040)	0.016	(0.038)	208.6	0.038
Share of a year that one's employed	2	-0.055**	(0.023)	0.013	(0.022)	202.4	0.000	-0.044*	(0.026)	0.003	(0.025)	21.1	0.114	-0.082*	(0.049)	0.027	(0.047)	113.3	0.003
Hours: all employment	0	-2.588***	(0.757)	-1.598**	(0.731)	165.7	0.082	-1.958***	(0.742)	-1.470**	(0.733)	40.8	0.419	-5.445***	(1.473)	-4.797***	(1.524)	255.5	0.631
Hours: all employment	1	-0.515	(0.876)	0.143	(0.852)	275.5	0.327	-0.605	(0.938)	-0.164	(0.935)	27.9	0.647	-1.146*	(1.632)	-0.425	(1.636)	208.4	0.619
Hours: all employment	2	1.475	(0.975)	3.423***	(0.936)	202.5	0.010	1.499	(1.126)	3.698***	(1.146)	21.1	0.094	2.009*	(2.032)	5.942***	(2.041)	113.4	0.015
Hours: home production	0	0.772***	(0.141)	0.505***	(0.141)	165.7	0.001	0.739***	(0.146)	0.503***	(0.143)	40.8	0.004	1.196***	(0.278)	0.870***	(0.289)	255.5	0.069
Hours: home production	1	0.036	(0.164)	0.038	(0.159)	275.5	0.979	0.091	(0.169)	0.044	(0.167)	27.9	0.696	0.039	(0.303)	-0.017	(0.300)	208.4	0.765
Hours: home production	2	0.396**	(0.178)	0.524***	(0.173)	202.5	0.198	0.325*	(0.189)	0.618***	(0.193)	21.1	0.083	0.418*	(0.366)	0.773**	(0.361)	113.4	0.080
Hours: other	0	1.817**	(0.755)	1.092	(0.731)	165.7	0.197	1.219	(0.746)	0.967	(0.735)	40.8	0.671	4.249***	(1.477)	3.927**	(1.529)	255.5	0.809
Hours: other	1	0.479	(0.876)	-0.182	(0.853)	275.5	0.318	0.514	(0.932)	0.120	(0.932)	27.9	0.679	1.107*	(1.637)	0.442	(1.638)	208.4	0.641
Hours: other	2	-1.870*	(0.977)	-3.946***	(0.936)	202.5	0.006	-1.824	(1.128)	-4.316***	(1.143)	21.1	0.056	-2.427*	(2.033)	-6.715***	(2.040)	113.4	0.008
Dummy—worked multiple jobs	0	0.119***	(0.023)	0.092***	(0.022)	330.3	0.055	0.116***	(0.023)	0.085***	(0.022)	41.5	0.034	0.201***	(0.045)	0.144***	(0.046)	238	0.070
Dummy—worked multiple jobs	1	0.108***	(0.027)	0.069***	(0.026)	291.5	0.017	0.102***	(0.030)	0.068**	(0.028)	26.3	0.147	0.166***	(0.051)	0.101**	(0.050)	188.4	0.057
Dummy—worked multiple jobs	2	0.069**	(0.032)	0.044	(0.032)	175.5	0.140	0.042	(0.035)	0.067*	(0.035)	20.2	0.426	0.163**	(0.067)	0.122*	(0.066)	93.3	0.282
Dummy—would like to work more	0	-0.012	(0.030)	-0.012	(0.029)	330.3	0.995	-0.048	(0.031)	-0.042	(0.030)	41.5	0.728	-0.005	(0.062)	-0.050	(0.061)	238	0.216
Dummy—would like to work more	1	0.039	(0.033)	0.013	(0.032)	291.5	0.127	0.010	(0.036)	0.027	(0.035)	26.3	0.503	0.151**	(0.064)	0.082	(0.064)	188.4	0.057
Dummy—would like to work more	2	-0.105***	(0.039)	-0.141***	(0.038)	175.5	0.060	-0.155***	(0.044)	-0.106***	(0.039)	20.2	0.133	-0.105*	(0.080)	-0.170**	(0.080)	93.3	0.102
Dummy—student (15–25 years)	0	0.131***	(0.034)	0.100***	(0.033)	87.4	0.204	0.122***	(0.033)	0.087***	(0.032)	22.3	0.163	0.181**	(0.071)	0.198***	(0.076)	116.4	0.762
Dummy—student (15–25 years)	1	0.068*	(0.041)	-0.019	(0.041)	140	0.002	0.098**	(0.044)	-0.047	(0.041)	13.8	0.000	0.089*	(0.078)	-0.059	(0.083)	88.9	0.013
Dummy—student (15–25 years)	2	-0.016	(0.046)	-0.079*	(0.047)	95.5	0.044	-0.033	(0.052)	-0.068	(0.052)	9.0	0.498	0.001	(0.098)	-0.131	(0.107)	50.2	0.053
Dummy—work in the same oblast	0	0.020***	(0.008)	0.034***	(0.008)	330.3	0.004	0.020**	(0.008)	0.034***	(0.008)	41.5	0.004	0.034**	(0.017)	0.075***	(0.018)	238	0.001
Dummy—work in the same oblast	1	0.012	(0.011)	0.021**	(0.011)	291.5	0.159	0.012	(0.011)	0.021*	(0.011)	26.3	0.319	0.010	(0.021)	0.033	(0.021)	188.4	0.085
Dummy—work in the same oblast	2	0.018	(0.014)	0.027*	(0.014)	175.5	0.199	0.016	(0.015)	0.027*	(0.016)	20.2	0.380	0.044*	(0.032)	0.077**	(0.031)	93.3	0.040
Dummy—work in another oblast	0	-0.019**	(0.008)	-0.023***	(0.008)	330.3	0.360	-0.017**	(0.008)	-0.023***	(0.008)	41.5	0.229	-0.020*	(0.017)	-0.035*	(0.018)	238	0.158
Dummy—work in another oblast	1	-0.013	(0.011)	-0.017	(0.011)	291.5	0.415	-0.011	(0.011)	-0.021*	(0.011)	26.3	0.170	-0.012	(0.021)	-0.034	(0.022)	188.4	0.057
Dummy—work in another oblast	2	-0.027**	(0.013)	-0.032**	(0.013)	175.5	0.444	-0.023	(0.014)	-0.035**	(0.014)	20.2	0.221	-0.051*	(0.030)	-0.065**	(0.029)	93.3	0.296
Dummy—work in another country	0	0.001	(0.008)	0.000	(0.009)	330.3	0.843	0.006	(0.008)	0.004	(0.009)	41.5	0.712	-0.010	(0.018)	-0.026	(0.020)	238	0.265
Dummy—work in another country	1	0.018	(0.012)	0.017	(0.012)	291.5	0.922	0.016	(0.012)	0.019	(0.013)	26.3	0.821	0.033*	(0.023)	0.028	(0.026)	188.4	0.752
Dummy—work in another country	2	0.018	(0.015)	0.009	(0.015)	175.5	0.284	0.022	(0.018)	0.009	(0.017)	20.2	0.425	0.028*	(0.033)	-0.005	(0.033)	93.3	0.099

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check the robustness of the regressions appearing in tables 3 – 6; the universe of individuals included in the regressions, outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table whose robustness they check. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. Columns 1–4 check robustness to controlling for exposure to a large (greater than 50 percent increase or decrease relative to the median) shock. Columns 6–9 check robustness to controlling for exposure to a large (greater than 50 percent increase or decrease relative to the median) shock and further instrumenting for this additional control (we add an additional, excluded instrument to our specification, which remains exactly identified: a dummy for the predicted shock to income being greater than 50% in absolute value). Columns 11–14 omit households who have a shock whose absolute value exceeds 50% during any year that the household is in the sample. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A14: Robustness of Effects of Income Fluctuations on Main Outcomes to Individuals in Narrower Age Ranges

Outcome	Lag	Excluding older individuals (15 ≤ age ≤ 50)						Including only youth (15 ≤ age < 25)						Excluding youth and older individuals (25 < age ≤ 50)					
		Women		Men				Women		Men				Women		Men			
		Coef. (1)	S.E (2)	Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	Coef. (6)	S.E (7)	Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)	Coef. (11)	S.E (12)	Coef. (13)	S.E (14)	F-stat (15)	P-value (11)=(13)
Dummy—departure from household	1	-0.030	(0.023)	-0.059**	(0.024)	235.3	0.040	-0.065	(0.067)	-0.153**	(0.066)	90.4	0.037	0.023*	(0.020)	-0.031	(0.022)	218.9	0.000
Dummy—departure from household	2	-0.020	(0.030)	-0.069**	(0.031)	148.5	0.002	0.032	(0.088)	-0.151*	(0.091)	53.5	0.001	0.009	(0.026)	-0.036	(0.028)	131.3	0.002
Dummy—departure from household	3	-0.036	(0.030)	-0.081***	(0.031)	131.8	0.009	0.096	(0.083)	-0.029	(0.084)	52	0.037	-0.041*	(0.027)	-0.091***	(0.031)	108.4	0.003
Share of a year that one's employed	0	-0.102***	(0.021)	-0.028	(0.019)	155.6	0.000	-0.112***	(0.034)	-0.050	(0.032)	70.8	0.017	-0.063***	(0.024)	0.030	(0.022)	138.2	0.000
Share of a year that one's employed	1	-0.071***	(0.026)	-0.003	(0.024)	202.9	0.000	-0.016	(0.046)	0.039	(0.045)	99.3	0.091	-0.080***	(0.029)	-0.002	(0.027)	202.2	0.000
Share of a year that one's employed	2	-0.085***	(0.029)	0.034	(0.027)	135.4	0.000	-0.073	(0.054)	0.078	(0.051)	66.3	0.000	-0.094***	(0.033)	0.015	(0.030)	132.6	0.000
Hours: all employment	0	-4.409***	(0.875)	-2.054**	(0.853)	155.5	0.000	-5.302***	(1.281)	-1.892	(1.214)	70.5	0.001	-3.253***	(1.090)	-0.810	(1.093)	138.2	0.005
Hours: all employment	1	-1.917*	(1.083)	0.157	(1.041)	202.8	0.011	-2.246	(1.721)	1.423	(1.678)	99.3	0.004	-1.845*	(1.287)	-0.044	(1.261)	202.1	0.071
Hours: all employment	2	0.989	(1.243)	5.114***	(1.191)	135.5	0.000	-1.794	(2.163)	4.858**	(2.045)	66.4	0.000	1.273*	(1.473)	5.026***	(1.423)	132.5	0.001
Hours: home production	0	0.916***	(0.149)	0.628***	(0.154)	155.5	0.002	0.893***	(0.210)	0.490**	(0.215)	70.5	0.015	0.905***	(0.186)	0.634***	(0.193)	138.2	0.022
Hours: home production	1	-0.011	(0.187)	0.056	(0.183)	202.8	0.545	-0.443	(0.276)	-0.517*	(0.276)	99.3	0.714	0.062	(0.226)	0.171	(0.225)	202.1	0.414
Hours: home production	2	0.402*	(0.209)	0.566***	(0.206)	135.5	0.167	0.687**	(0.334)	0.524	(0.327)	66.4	0.447	0.356*	(0.262)	0.623**	(0.268)	132.5	0.076
Hours: other	0	3.493***	(0.867)	1.427*	(0.847)	155.5	0.002	4.408***	(1.278)	1.402	(1.203)	70.5	0.003	2.348**	(1.084)	0.176	(1.086)	138.2	0.011
Hours: other	1	1.928*	(1.082)	-0.213	(1.042)	202.8	0.008	2.689	(1.723)	-0.906	(1.665)	99.3	0.005	1.783*	(1.282)	-0.127	(1.259)	202.1	0.052
Hours: other	2	-1.391	(1.242)	-5.680***	(1.190)	135.5	0.000	1.108	(2.152)	-5.382***	(2.027)	66.4	0.000	-1.629*	(1.466)	-5.649***	(1.418)	132.5	0.000
Dummy—worked multiple jobs	0	0.138***	(0.025)	0.114***	(0.024)	256.8	0.137	0.100*	(0.053)	0.069	(0.050)	83.6	0.361	0.145***	(0.028)	0.122***	(0.027)	236.1	0.233
Dummy—worked multiple jobs	1	0.108***	(0.033)	0.079**	(0.032)	199.6	0.129	0.082	(0.069)	0.017	(0.066)	54.6	0.115	0.117***	(0.036)	0.097***	(0.036)	198.6	0.402
Dummy—worked multiple jobs	2	0.070*	(0.037)	0.049	(0.038)	117.4	0.300	0.061	(0.084)	0.037	(0.082)	32.2	0.570	0.076*	(0.042)	0.068	(0.045)	113.2	0.757
Dummy—would like to work more	0	0.022	(0.032)	0.032	(0.031)	256.8	0.588	-0.178***	(0.068)	-0.085	(0.062)	83.6	0.034	0.073**	(0.035)	0.069**	(0.034)	236.1	0.833
Dummy—would like to work more	1	0.050	(0.038)	0.025	(0.037)	199.6	0.238	-0.131	(0.080)	-0.065	(0.072)	54.6	0.179	0.111***	(0.042)	0.067	(0.042)	198.6	0.062
Dummy—would like to work more	2	-0.107**	(0.046)	-0.163***	(0.046)	117.4	0.015	-0.105	(0.089)	-0.117	(0.083)	32.2	0.821	-0.107**	(0.052)	-0.187***	(0.054)	113.2	0.003
Dummy—student (15–25 years)	0	0.118***	(0.034)	0.096***	(0.033)	76.8	0.404	0.118***	(0.035)	0.098***	(0.034)	70.8	0.477	-0.051	(0.114)	0.009	(0.064)	13.3	0.521
Dummy—student (15–25 years)	1	0.073*	(0.044)	-0.016	(0.044)	109.3	0.004	0.084*	(0.046)	-0.001	(0.047)	99.3	0.008	-0.174*	(0.161)	-0.079	(0.131)	4.7	0.391
Dummy—student (15–25 years)	2	-0.009	(0.053)	-0.086	(0.052)	74.8	0.029	-0.011	(0.057)	-0.089	(0.055)	66.3	0.036	0.062	(0.106)	0.089	(0.178)	6.2	0.809
Dummy—work in the same oblast	0	0.023***	(0.009)	0.037***	(0.009)	256.8	0.026	0.037	(0.026)	0.065**	(0.026)	83.6	0.123	0.020**	(0.008)	0.033***	(0.008)	236.1	0.025
Dummy—work in the same oblast	1	0.011	(0.013)	0.018	(0.013)	199.6	0.357	0.009	(0.040)	0.024	(0.038)	54.6	0.475	0.023**	(0.011)	0.035***	(0.011)	198.6	0.110
Dummy—work in the same oblast	2	0.023	(0.017)	0.032*	(0.018)	117.4	0.234	0.003	(0.054)	0.035	(0.053)	32.2	0.195	0.029**	(0.014)	0.036**	(0.015)	113.2	0.324
Dummy—work in another oblast	0	-0.021**	(0.009)	-0.025**	(0.010)	256.8	0.458	-0.037	(0.026)	-0.050*	(0.028)	83.6	0.399	-0.014*	(0.008)	-0.015*	(0.009)	236.1	0.777
Dummy—work in another oblast	1	-0.013	(0.013)	-0.016	(0.014)	199.6	0.604	-0.040	(0.039)	-0.048	(0.041)	54.6	0.581	0.001	(0.011)	-0.006	(0.012)	198.6	0.308
Dummy—work in another oblast	2	-0.034**	(0.017)	-0.037**	(0.017)	117.4	0.639	-0.089*	(0.049)	-0.094**	(0.048)	32.2	0.771	-0.009	(0.014)	-0.016	(0.015)	113.2	0.306
Dummy—work in another country	0	-0.009	(0.010)	-0.005	(0.011)	256.8	0.581	-0.043	(0.028)	-0.015	(0.029)	83.6	0.186	0.000	(0.010)	-0.004	(0.011)	236.1	0.649
Dummy—work in another country	1	0.017	(0.015)	0.019	(0.016)	199.6	0.805	-0.001	(0.041)	0.023	(0.042)	54.6	0.352	0.020*	(0.014)	0.009	(0.016)	198.6	0.292
Dummy—work in another country	2	0.023	(0.019)	0.011	(0.019)	117.4	0.282	0.079	(0.065)	0.083	(0.062)	32.2	0.909	0.008	(0.017)	-0.017	(0.018)	113.2	0.030

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check the robustness of the regressions appearing in tables 3 – 6 to excluding individuals over 50 (columns 1–4), excluding individuals outside of the 15–25 age range and thus focus only on youth (columns 6–9), and excluding individuals under 25 and over 50 (columns 11–14). The regression outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table whose robustness they check. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A15: Robustness of Effects of Income Fluctuations on Main Outcomes to Different Income Specifications

Outcome	Lag	Income: Original specification: Women Coef. (1)	S.E (2)	Original specification: Men Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	Income: Log income: Women Coef. (6)	S.E (7)	Log income: Men Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)	Income: Standardized income (non-log): Women Coef. (11)	S.E (12)	Standardized income (non-log): Men Coef. (13)	S.E (14)	F-stat (15)	P-value (11)=(13)
Dummy—departure from household	1	-0.030*	(0.018)	-0.043**	(0.019)	277.7	0.273	-0.025*	(0.015)	-0.034**	(0.015)	255.8	0.003	-0.021**	(0.010)	-0.027***	(0.010)	64.1	0.004
Dummy—departure from household	2	-0.024	(0.022)	-0.055**	(0.023)	195.6	0.014	-0.030*	(0.018)	-0.040**	(0.018)	198.1	0.007	-0.014*	(0.014)	-0.020	(0.014)	38.4	0.006
Dummy—departure from household	3	-0.034	(0.022)	-0.054**	(0.023)	176.5	0.158	-0.037**	(0.018)	-0.042**	(0.018)	187.4	0.258	-0.043**	(0.017)	-0.047***	(0.017)	25	0.126
Share of a year that one's employed	0	-0.057***	(0.017)	-0.007	(0.016)	172.2	0.000	-0.021	(0.015)	-0.017	(0.015)	272.1	0.553	-0.010*	(0.009)	-0.014	(0.009)	59.1	0.366
Share of a year that one's employed	1	-0.039*	(0.022)	0.010	(0.020)	243.4	0.003	-0.007	(0.017)	-0.005	(0.017)	264.2	0.801	-0.008*	(0.010)	-0.012	(0.010)	54.5	0.377
Share of a year that one's employed	2	-0.060**	(0.024)	0.019	(0.022)	177.9	0.000	-0.022	(0.018)	-0.014	(0.018)	177.2	0.347	0.002	(0.015)	0.001	(0.015)	32.9	0.869
Hours: all employment	0	-2.409***	(0.705)	-1.331*	(0.687)	172.1	0.066	-1.703***	(0.610)	-1.253**	(0.609)	271.9	0.090	-1.318***	(0.345)	-1.406***	(0.344)	59	0.670
Hours: all employment	1	-0.691	(0.874)	0.327	(0.851)	243.2	0.155	-0.331	(0.688)	0.022	(0.687)	264	0.256	-0.516*	(0.463)	-0.673	(0.471)	54.5	0.504
Hours: all employment	2	1.310	(0.990)	3.673***	(0.955)	178	0.003	1.674**	(0.779)	2.147***	(0.774)	177.2	0.178	1.678**	(0.683)	1.609**	(0.648)	32.9	0.788
Hours: home production	0	0.719***	(0.130)	0.453***	(0.131)	172.1	0.001	0.629***	(0.127)	0.564***	(0.126)	271.9	0.008	0.395***	(0.080)	0.336***	(0.079)	59	0.009
Hours: home production	1	0.036	(0.163)	0.031	(0.158)	243.2	0.958	0.155	(0.138)	0.138	(0.137)	264	0.555	0.135*	(0.085)	0.107	(0.085)	54.5	0.251
Hours: home production	2	0.391**	(0.181)	0.534***	(0.175)	178	0.171	0.430***	(0.154)	0.434***	(0.153)	177.2	0.902	0.336***	(0.125)	0.330***	(0.126)	32.9	0.823
Hours: other	0	1.690**	(0.704)	0.879	(0.687)	172.1	0.159	1.074*	(0.609)	0.689	(0.608)	271.9	0.143	0.923***	(0.355)	1.069***	(0.352)	59	0.472
Hours: other	1	0.655	(0.875)	-0.358	(0.851)	243.2	0.150	0.176	(0.692)	-0.160	(0.690)	264	0.276	0.381*	(0.463)	0.566	(0.470)	54.5	0.426
Hours: other	2	-1.701*	(0.992)	-4.207***	(0.955)	178	0.002	-2.104***	(0.786)	-2.581***	(0.778)	177.2	0.171	-2.014***	(0.710)	-1.939***	(0.673)	32.9	0.770
Dummy—worked multiple jobs	0	0.112***	(0.022)	0.085***	(0.021)	313.8	0.071	0.073***	(0.019)	0.110***	(0.018)	291.8	0.000	0.033**	(0.014)	0.057***	(0.014)	60.3	0.000
Dummy—worked multiple jobs	1	0.106***	(0.027)	0.069***	(0.026)	250.5	0.032	0.033	(0.022)	0.068***	(0.022)	244.2	0.000	0.027*	(0.016)	0.049***	(0.015)	46	0.000
Dummy—worked multiple jobs	2	0.070**	(0.032)	0.043	(0.032)	153.1	0.131	0.014	(0.027)	0.043	(0.027)	147.3	0.000	0.048*	(0.025)	0.067***	(0.024)	24.1	0.001
Dummy—would like to work more	0	-0.011	(0.028)	-0.011	(0.027)	313.8	0.998	-0.033	(0.025)	-0.033	(0.025)	291.8	0.944	-0.090***	(0.019)	-0.089***	(0.018)	60.3	0.684
Dummy—would like to work more	1	0.041	(0.033)	0.012	(0.032)	250.5	0.117	-0.019	(0.027)	-0.021	(0.027)	244.2	0.692	-0.062***	(0.019)	-0.062***	(0.019)	46	0.988
Dummy—would like to work more	2	-0.105***	(0.039)	-0.143***	(0.039)	153.1	0.054	-0.112***	(0.033)	-0.118***	(0.033)	147.3	0.416	-0.093***	(0.030)	-0.093***	(0.029)	24.1	0.976
Dummy—student (15–25 years)	0	0.122***	(0.032)	0.092***	(0.031)	87.8	0.230	0.098***	(0.027)	0.102***	(0.027)	140.5	0.670	0.041**	(0.017)	0.038**	(0.018)	25.2	0.652
Dummy—student (15–25 years)	1	0.070*	(0.041)	-0.021	(0.040)	116.2	0.002	0.022	(0.032)	0.020	(0.032)	149.4	0.861	0.002	(0.024)	-0.006	(0.026)	19.1	0.390
Dummy—student (15–25 years)	2	-0.010	(0.047)	-0.085*	(0.047)	83.3	0.022	-0.010	(0.036)	-0.016	(0.036)	98.4	0.666	-0.015	(0.034)	-0.026	(0.035)	13.9	0.304
Dummy—work in the same oblast	0	0.017**	(0.007)	0.032***	(0.008)	313.8	0.004	0.015**	(0.006)	0.020***	(0.006)	291.8	0.034	0.009***	(0.003)	0.013***	(0.003)	60.3	0.010
Dummy—work in the same oblast	1	0.013	(0.011)	0.020*	(0.010)	250.5	0.261	0.008	(0.008)	0.013*	(0.008)	244.2	0.015	0.004*	(0.005)	0.008*	(0.005)	46	0.010
Dummy—work in the same oblast	2	0.019	(0.014)	0.027*	(0.014)	153.1	0.279	0.021*	(0.012)	0.026**	(0.011)	147.3	0.058	0.018**	(0.008)	0.022***	(0.008)	24.1	0.044
Dummy—work in another oblast	0	-0.016**	(0.008)	-0.021***	(0.008)	313.8	0.347	-0.015**	(0.007)	-0.017***	(0.006)	291.8	0.278	-0.009**	(0.004)	-0.011***	(0.004)	60.3	0.098
Dummy—work in another oblast	1	-0.014	(0.011)	-0.017	(0.011)	250.5	0.540	-0.014*	(0.008)	-0.017**	(0.008)	244.2	0.158	-0.009**	(0.004)	-0.012***	(0.004)	46	0.024
Dummy—work in another oblast	2	-0.028**	(0.014)	-0.032**	(0.013)	153.1	0.431	-0.025**	(0.011)	-0.029***	(0.011)	147.3	0.087	-0.019***	(0.007)	-0.022***	(0.007)	24.1	0.051
Dummy—work in another country	0	0.002	(0.008)	0.001	(0.008)	313.8	0.827	0.009	(0.007)	0.010	(0.007)	291.8	0.498	0.001	(0.004)	-0.001	(0.004)	60.3	0.128
Dummy—work in another country	1	0.017	(0.012)	0.018	(0.012)	250.5	0.972	0.021**	(0.009)	0.020**	(0.009)	244.2	0.915	0.014**	(0.007)	0.010	(0.007)	46	0.039
Dummy—work in another country	2	0.018	(0.016)	0.009	(0.016)	153.1	0.354	0.015	(0.013)	0.014	(0.012)	147.3	0.607	0.000	(0.010)	-0.004	(0.010)	24.1	0.023

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check the robustness of the regressions appearing in tables 3 – 6; the universe of individuals included in the regressions, outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table whose robustness they check. In this table, instead of a shock to income, we consider either logged total net household income (columns 6–9) or standardized total net household income (not logged) (columns 11–14). Original specifications appear in columns 1–4, for comparison purposes. All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A16: Robustness of Effects of Income Fluctuations on Main Outcomes to Different Sample Restriction Criteria

Outcome	Lag	Excluding ... from the sample: Top and bottom 3 % of obs. of HH income — Women Coef. (1)	S.E (2)	Men Coef. (3)	S.E (4)	F-stat (5)	P-value (1)=(3)	Excluding ... from the sample: Bishkek and urban Osh — Women Coef. (6)	S.E (7)	Men Coef. (8)	S.E (9)	F-stat (10)	P-value (6)=(8)
Dummy—departure from household	1	-0.024	(0.020)	-0.042**	(0.020)	238.5	0.156	-0.039**	(0.019)	-0.049**	(0.020)	249.4	0.416
Dummy—departure from household	2	-0.016	(0.023)	-0.043*	(0.023)	187.9	0.043	-0.024	(0.024)	-0.056**	(0.025)	169.2	0.021
Dummy—departure from household	3	-0.028	(0.022)	-0.041*	(0.023)	179.6	0.352	-0.035	(0.023)	-0.056**	(0.024)	162.1	0.144
Share of a year that one's employed	0	-0.045**	(0.018)	-0.001	(0.017)	159.6	0.002	-0.049***	(0.017)	-0.008	(0.016)	161.1	0.004
Share of a year that one's employed	1	-0.039*	(0.023)	0.011	(0.022)	206.3	0.004	-0.024	(0.023)	0.016	(0.021)	216.1	0.018
Share of a year that one's employed	2	-0.072***	(0.024)	0.020	(0.023)	168.1	0.000	-0.051**	(0.025)	0.016	(0.024)	158.8	0.000
Hours: all employment	0	-2.037***	(0.727)	-1.092	(0.711)	159.4	0.121	-1.701**	(0.703)	-1.021	(0.698)	160.9	0.260
Hours: all employment	1	-0.873	(0.936)	0.336	(0.910)	206.2	0.108	0.379	(0.900)	1.103	(0.877)	215.9	0.327
Hours: all employment	2	0.961	(0.988)	3.660***	(0.958)	168.1	0.001	1.978*	(1.029)	3.888***	(1.007)	158.9	0.022
Hours: home production	0	0.783***	(0.137)	0.497***	(0.139)	159.4	0.001	0.850***	(0.139)	0.549***	(0.141)	160.9	0.001
Hours: home production	1	0.074	(0.179)	0.081	(0.171)	206.2	0.943	0.084	(0.177)	0.062	(0.172)	215.9	0.841
Hours: home production	2	0.371*	(0.189)	0.461**	(0.181)	168.1	0.415	0.351*	(0.202)	0.501**	(0.196)	158.9	0.195
Hours: other	0	1.254*	(0.726)	0.595	(0.710)	159.4	0.272	0.851	(0.703)	0.473	(0.697)	160.9	0.523
Hours: other	1	0.799	(0.935)	-0.417	(0.909)	206.2	0.099	-0.463	(0.900)	-1.165	(0.876)	215.9	0.333
Hours: other	2	-1.332	(0.989)	-4.121***	(0.956)	168.1	0.001	-2.329**	(1.030)	-4.388***	(1.004)	158.9	0.012
Dummy—worked multiple jobs	0	0.126***	(0.023)	0.085***	(0.022)	296.4	0.007	0.118***	(0.023)	0.093***	(0.022)	283.7	0.127
Dummy—worked multiple jobs	1	0.129***	(0.029)	0.080***	(0.028)	221.4	0.006	0.117***	(0.029)	0.081***	(0.028)	227.1	0.048
Dummy—worked multiple jobs	2	0.082**	(0.033)	0.044	(0.032)	148.8	0.045	0.082**	(0.035)	0.057*	(0.035)	136.2	0.214
Dummy—would like to work more	0	0.048	(0.029)	0.030	(0.028)	296.4	0.295	0.002	(0.029)	0.007	(0.028)	283.7	0.755
Dummy—would like to work more	1	0.066*	(0.035)	0.027	(0.034)	221.4	0.037	0.049	(0.033)	0.024	(0.033)	227.1	0.205
Dummy—would like to work more	2	-0.098**	(0.039)	-0.146***	(0.039)	148.8	0.019	-0.092**	(0.040)	-0.126***	(0.040)	136.2	0.113
Dummy—student (15–25 years)	0	0.117***	(0.033)	0.095***	(0.031)	82.5	0.401	0.111***	(0.033)	0.088***	(0.032)	76.5	0.367
Dummy—student (15–25 years)	1	0.081*	(0.043)	-0.006	(0.042)	102.2	0.004	0.057	(0.043)	-0.012	(0.043)	97.1	0.022
Dummy—student (15–25 years)	2	-0.003	(0.048)	-0.084*	(0.049)	76.9	0.015	-0.004	(0.051)	-0.061	(0.052)	70.1	0.092
Dummy—work in the same oblast	0	0.017**	(0.008)	0.032***	(0.008)	296.4	0.004	0.020***	(0.008)	0.034***	(0.008)	283.7	0.014
Dummy—work in the same oblast	1	0.016	(0.011)	0.021*	(0.011)	221.4	0.408	0.019*	(0.011)	0.025**	(0.011)	227.1	0.340
Dummy—work in the same oblast	2	0.022	(0.015)	0.028*	(0.015)	148.8	0.438	0.022	(0.016)	0.029*	(0.016)	136.2	0.380
Dummy—work in another oblast	0	-0.017**	(0.008)	-0.022***	(0.008)	296.4	0.273	-0.020**	(0.008)	-0.025***	(0.008)	283.7	0.382
Dummy—work in another oblast	1	-0.009	(0.011)	-0.011	(0.012)	221.4	0.728	-0.020*	(0.011)	-0.022*	(0.012)	227.1	0.779
Dummy—work in another oblast	2	-0.031**	(0.014)	-0.034**	(0.014)	148.8	0.590	-0.036**	(0.015)	-0.037**	(0.015)	136.2	0.818
Dummy—work in another country	0	-0.002	(0.008)	-0.002	(0.009)	296.4	0.907	-0.002	(0.008)	-0.000	(0.009)	283.7	0.779
Dummy—work in another country	1	0.011	(0.013)	0.013	(0.014)	221.4	0.772	0.011	(0.012)	0.014	(0.013)	227.1	0.716
Dummy—work in another country	2	0.019	(0.016)	0.011	(0.016)	148.8	0.433	0.021	(0.017)	0.012	(0.017)	136.2	0.358

Source: Authors' calculations based on KIHS 2004–2016.

Notes: These results check the robustness of the regressions appearing in tables 3 – 6; the universe of individuals included in the regressions, outcomes, controls, and lag structures (indicated in the column titled, 'Lag') match those of the corresponding main text table whose robustness they check. An income shock is the percentage change in income relative to household median income in the regressions, instrumented using the predicted percentage change in income relative to household median income. Columns 1–4 check robustness to dropping the bottom and top 3% of observations of total household income. Columns 6–9 check robustness to omitting the two largest urban parts of Kyrgyzstan: Bishkek (the capital) and the urban part of Osh (which includes Osh City). All regressions include household and year fixed effects and our full set of controls; see the notes from table 2 for descriptions of the control sets used. Standard errors are in parentheses and clustered at the household level. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A17: Corrections for Multiple Hypothesis Testing

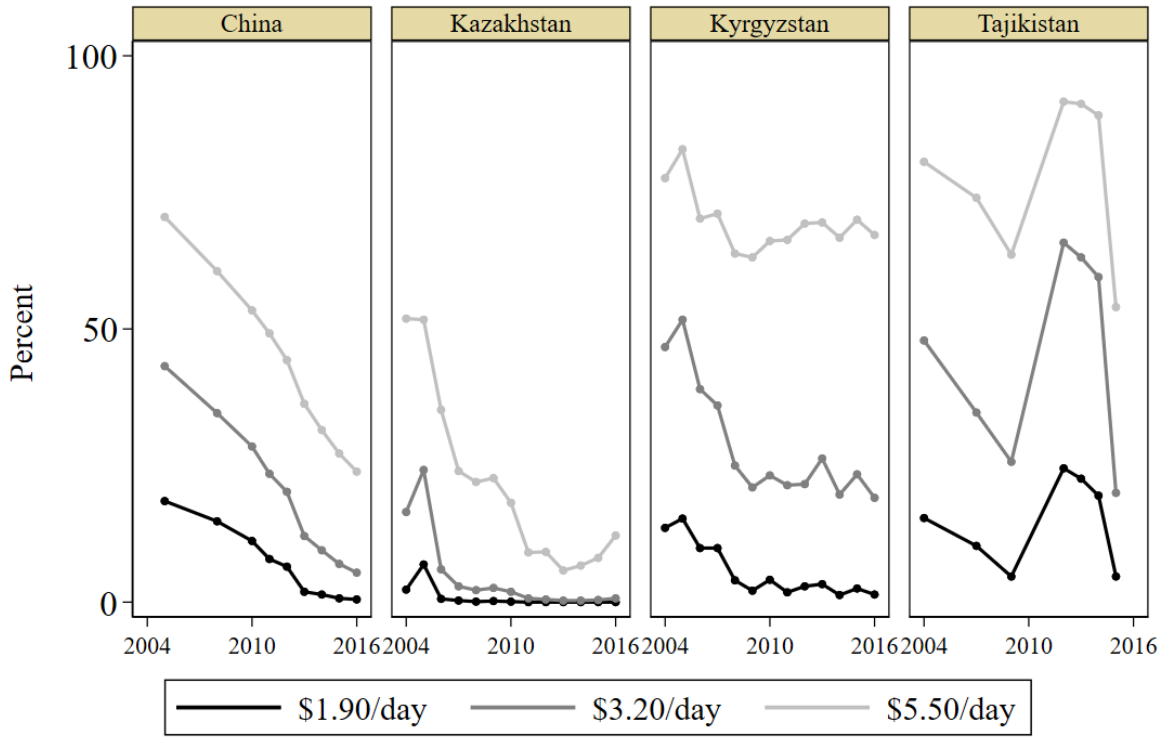
		P-values								
		Women			Men			P-value diff		
Outcomes	Lag	Unadj. (1)	BH Adj. (2)	BKY Adj. (3)	Unadj. (4)	BH Adj. (5)	BKY Adj. (6)	Unadj. (7)	BH Adj. (8)	BKY Adj. (9)
Departure from household	1	0.096	0.191	0.131	0.020	0.060	0.047	0.273	0.376	0.234
Departure from household	2	0.292	0.391	0.240	0.016	0.052	0.040	0.014	0.052	0.040
Departure from household	3	0.117	0.223	0.149	0.019	0.059	0.046	0.158	0.264	0.175
Share of a year that one's employed	0	0.001	0.007	0.006	0.653	0.761	0.413	0.000	0.001	0.001
Share of a year that one's employed	1	0.073	0.156	0.107	0.638	0.752	0.406	0.003	0.015	0.012
Share of a year that one's employed	2	0.011	0.042	0.033	0.388	0.499	0.311	0.000	0.001	0.001
Hours: all employment	0	0.001	0.007	0.006	0.053	0.130	0.090	0.066	0.149	0.101
Hours: all employment	1	0.429	0.541	0.326	0.701	0.776	0.413	0.155	0.264	0.175
Hours: all employment	2	0.186	0.293	0.185	0.000	0.001	0.001	0.003	0.015	0.012
Hours: home production	0	0.000	0.001	0.001	0.001	0.007	0.006	0.001	0.007	0.006
Hours: home production	1	0.826	0.871	0.432	0.846	0.882	0.432	0.958	0.978	0.463
Hours: home production	2	0.031	0.083	0.061	0.002	0.011	0.010	0.171	0.278	0.183
Hours: other	0	0.016	0.052	0.040	0.201	0.302	0.189	0.159	0.264	0.175
Hours: other	1	0.454	0.562	0.337	0.674	0.776	0.413	0.15	0.264	0.175
Hours: other	2	0.086	0.174	0.120	0.000	0.001	0.001	0.002	0.011	0.010
Dummy—worked multiple jobs	0	0.000	0.001	0.001	0.000	0.001	0.001	0.071	0.156	0.107
Dummy—worked multiple jobs	1	0.000	0.001	0.001	0.008	0.032	0.026	0.032	0.084	0.061
Dummy—worked multiple jobs	2	0.029	0.080	0.058	0.184	0.293	0.185	0.131	0.241	0.161
Dummy—would like to work more	0	0.698	0.776	0.413	0.688	0.776	0.413	0.998	0.998	0.477
Dummy—would like to work more	1	0.214	0.317	0.200	0.705	0.776	0.413	0.117	0.223	0.149
Dummy—would like to work more	2	0.008	0.032	0.026	0.000	0.001	0.001	0.054	0.130	0.090
Dummy—student (15–25 years)	0	0.000	0.001	0.001	0.003	0.015	0.012	0.23	0.330	0.210
Dummy—student (15–25 years)	1	0.084	0.174	0.120	0.609	0.727	0.387	0.002	0.011	0.010
Dummy—student (15–25 years)	2	0.825	0.871	0.432	0.074	0.156	0.107	0.022	0.065	0.050
Dummy—work in the same oblast	0	0.015	0.052	0.040	0.000	0.001	0.001	0.004	0.018	0.015
Dummy—work in the same oblast	1	0.226	0.330	0.209	0.055	0.130	0.090	0.261	0.364	0.226
Dummy—work in the same oblast	2	0.193	0.299	0.186	0.060	0.139	0.094	0.279	0.379	0.235
Dummy—work in another oblast	0	0.028	0.080	0.058	0.008	0.032	0.026	0.347	0.459	0.287
Dummy—work in another oblast	1	0.200	0.302	0.189	0.127	0.238	0.159	0.540	0.660	0.359
Dummy—work in another oblast	2	0.042	0.107	0.076	0.015	0.052	0.040	0.431	0.541	0.326
Dummy—work in another country	0	0.776	0.845	0.426	0.916	0.945	0.460	0.827	0.871	0.432
Dummy—work in another country	1	0.140	0.252	0.167	0.160	0.264	0.175	0.972	0.982	0.465
Dummy—work in another country	2	0.250	0.354	0.218	0.553	0.668	0.359	0.354	0.462	0.287

Source: Author's calculation based on KIHS 2004-2016.

Notes: All hypotheses in the main text tables were grouped into a single group. Unadjusted p-values for all of the main outcomes are presented in columns 1, 4, and 7. Columns 2, 5, and 8 use Benjamini and Hochberg 1995 q-values while column 3, 6, and 9 present Benjamini, Krieger, and Yekutieli 2006 sharpened two-stage q-values.

Appendix B Appendix Figures

Figure A1: Poverty headcount ratio for Kyrgyzstan and bordering countries



Source: World Bank DataBank World Development Indicators.
Notes: We wanted to include each of the four countries that border Kyrgyzstan (Kazakhstan, China, Tajikistan and Uzbekistan), but data were not available for Uzbekistan. Some years for the China and Tajikistan series have missing data. The poverty headcount ratio at $X a day is the percentage of the population living on less than $X a day at 2011 international prices.

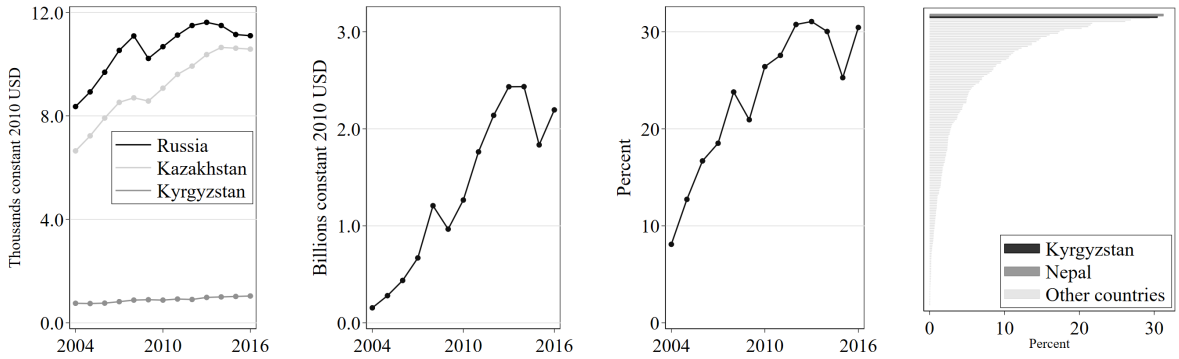
Figure A2: Kyrgyzstan GDP per capita and remittances

a) GDP per capita in migrant destinations

b) Kyrgyzstan remittances received

c) Kyrgyzstan remittances received as a share of GDP

d) Remittances as a share of GDP (2016)



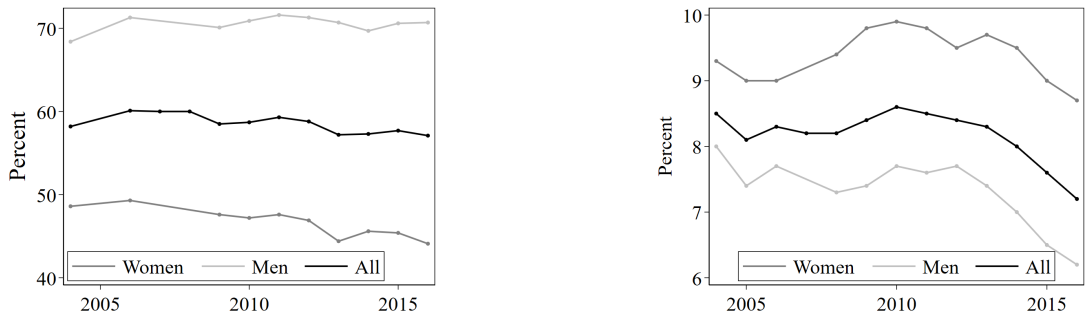
Source: World Bank 2017b

Notes: Subfigure (d) includes the 176 countries that have data available in 2016. Personal remittances comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from nonresident households. Personal transfers thus include all current transfers between resident and nonresident individuals. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities. GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.

Figure A3: Kyrgyzstan labor market

(a) Employment to population ratio

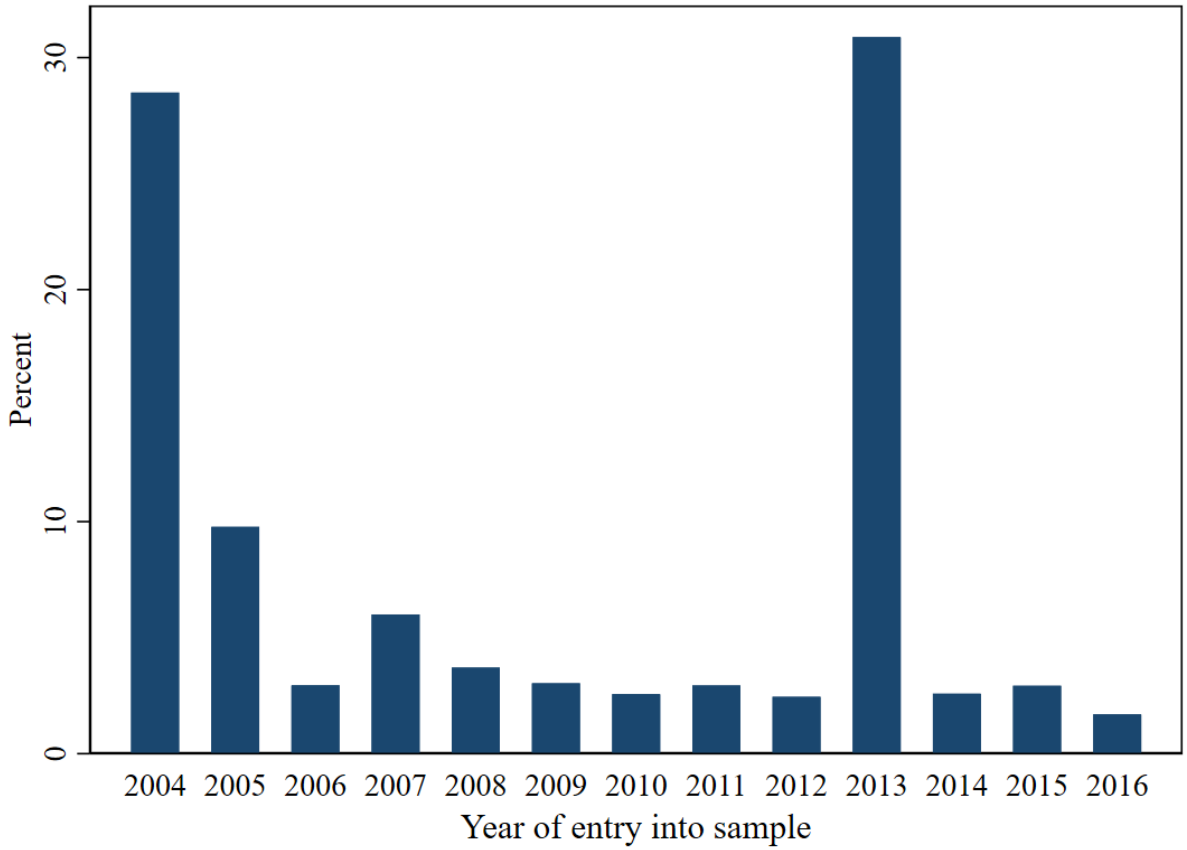
(b) Unemployment rate



Source: World Bank 2017b

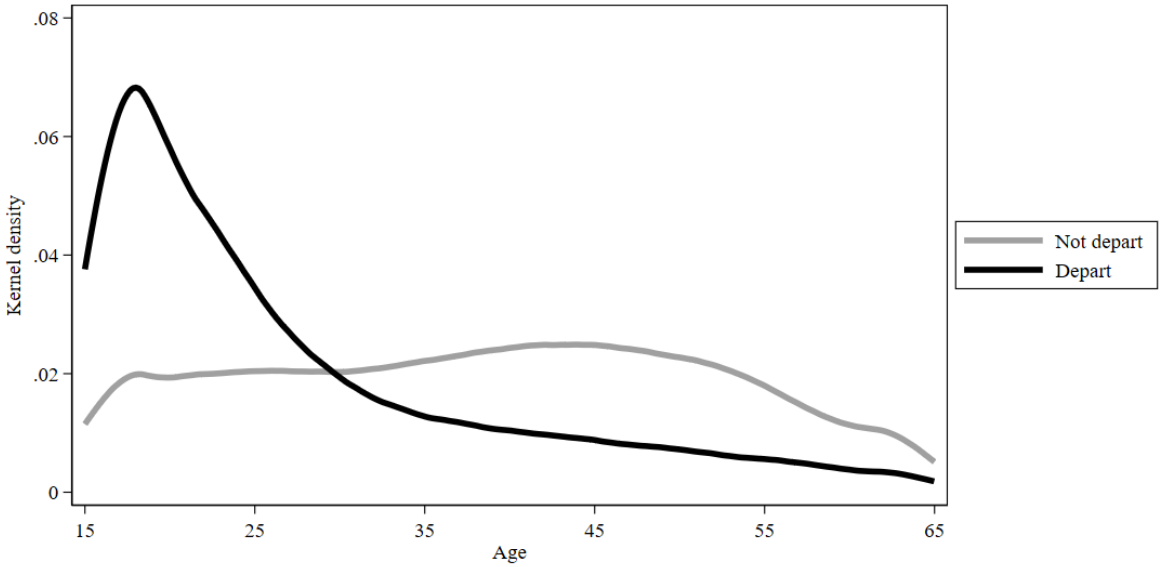
Notes: Unemployment rate represents the unemployed share of the labor force. The employment to population ratio is the share of the total 15+ population that is employed.

Figure A4: Distribution of years of household entry



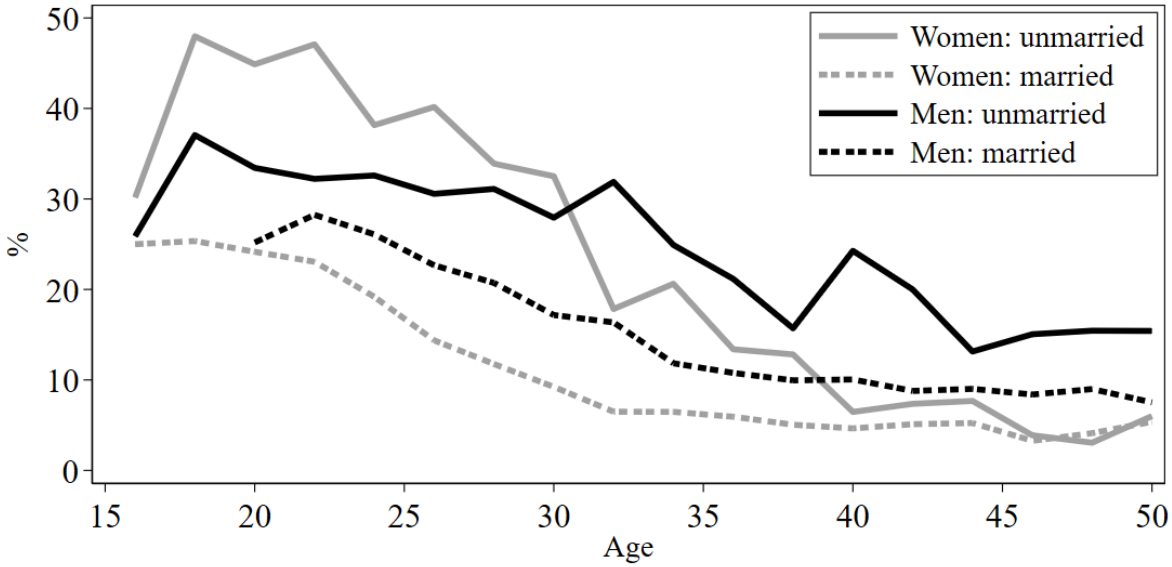
Source: Authors' calculations based on KIHS 2004–2016.

Figure A5: Age distribution of individuals who depart vs. do not depart from the household



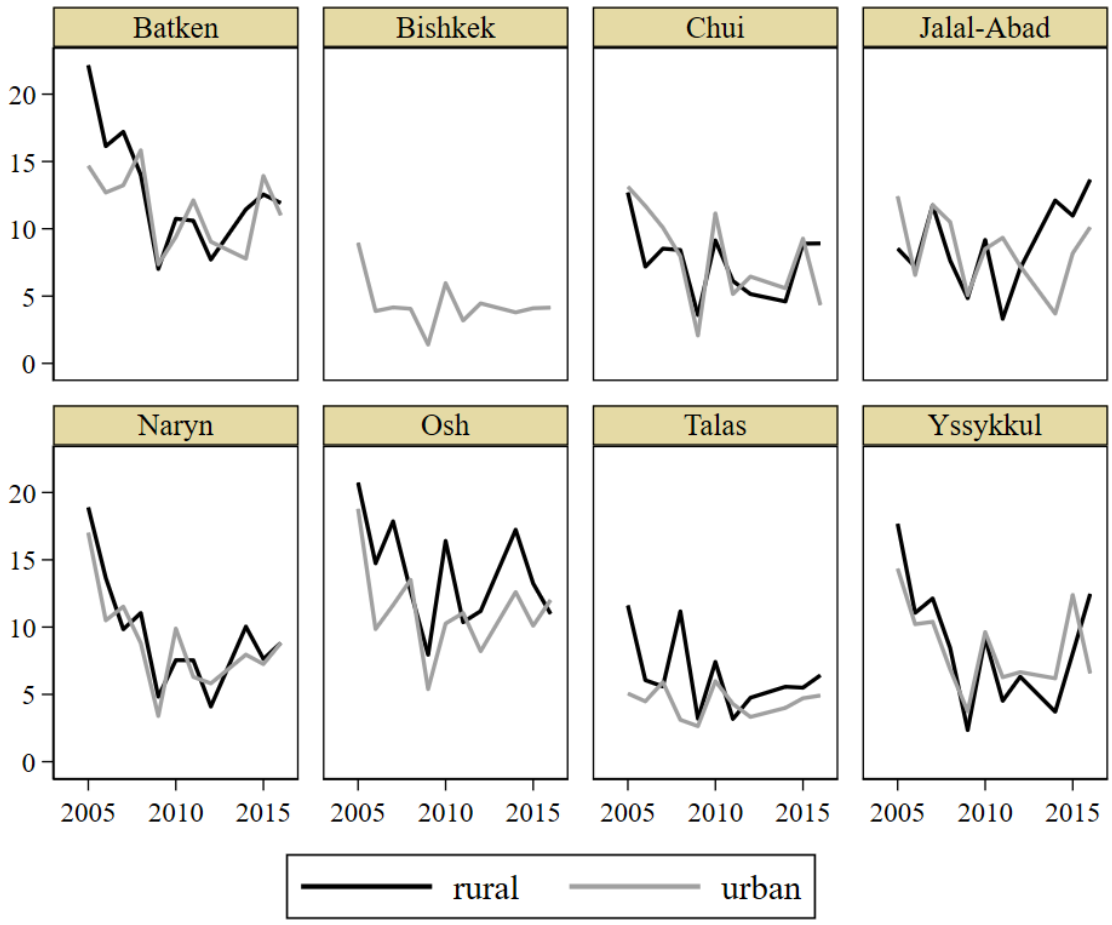
Source: Authors' calculations based on KIHS 2004–2016.
Notes: Individual departure from the household is defined as leaving the household roster at some point in our sample. Age refers to the age when the individual enters the sample. The universe is individuals 15-65 years old (inclusive).

Figure A6: Annual household departure rates by age, gender, and marital status



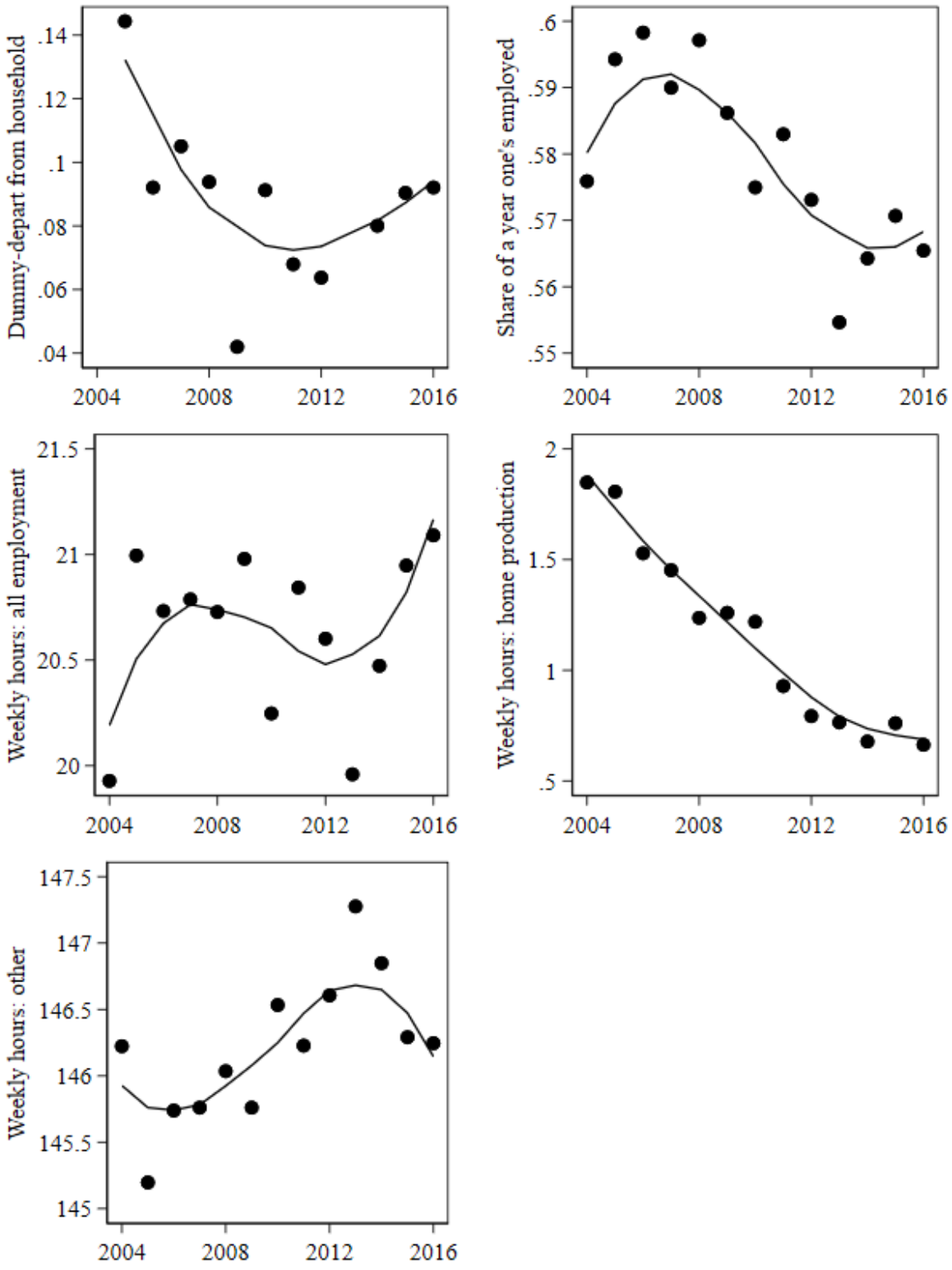
Source: Authors' calculations based on KIHS 2004–2016.
Notes: The annual household departure rates are calculated over years *after* the individual enters the sample. If an individual departs from the household, then subsequent years for that individual (e.g., should they subsequently return to the household) are not considered. An individual's annual household departure rate is calculated as the reciprocal of the number of years in the sample if the individual departs from the household at some point and 0 otherwise. Individual annual household departure rates are then averaged over age, sex, and marital status. To smooth the plot, individual ages are rounded to the nearest even number. Age and marital status represent the year individuals enter the sample. Two observations dropped from the plot because the averages are calculated on fewer than 15 observations: age 16 and 18 married men and age 50 unmarried men.

Figure A7: Percentage of sample departing from the household by year, region, and urbanization status



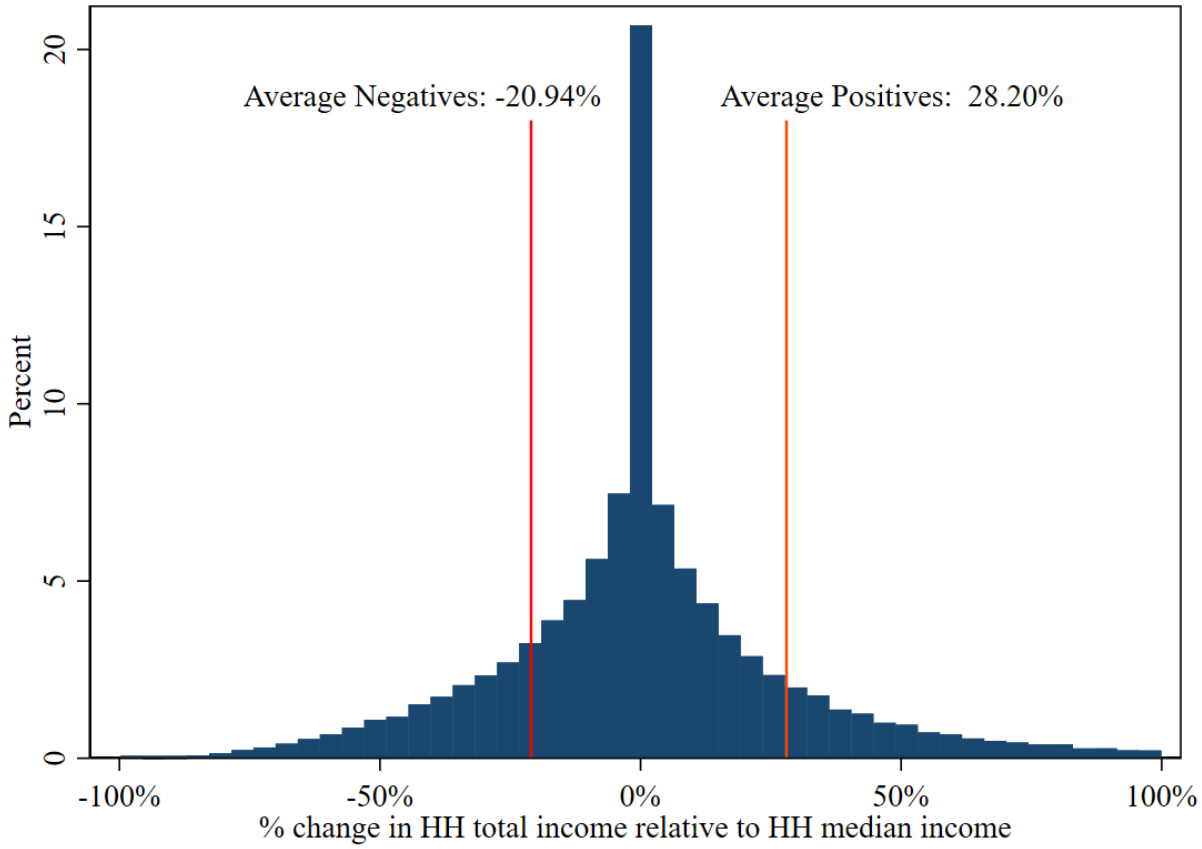
Source: Authors' calculations based on KIHS 2004–2016.
Notes: Household departure is a dummy that takes on a missing value in the first year in which an individual appears in the sample and then takes on either a value of 0 or 1 in the subsequent year. It takes on a 0 if the individual remains a household member, and continue to take on a 0 as long as the individual does not leave the household. It takes on a 1 if the individual leaves the household since the previous round (i.e. is no longer listed on the household roster), in which case it is missing in all subsequent years unless the individual returns. If an individual who departs from household returns to the household, then it takes a missing value in the year of return year, and a 0 or 1 the following year. The universe is individuals 15-65 years old (inclusive) in their initial year in our sample.

Figure A8: Trends of important household departure and labor supply outcomes



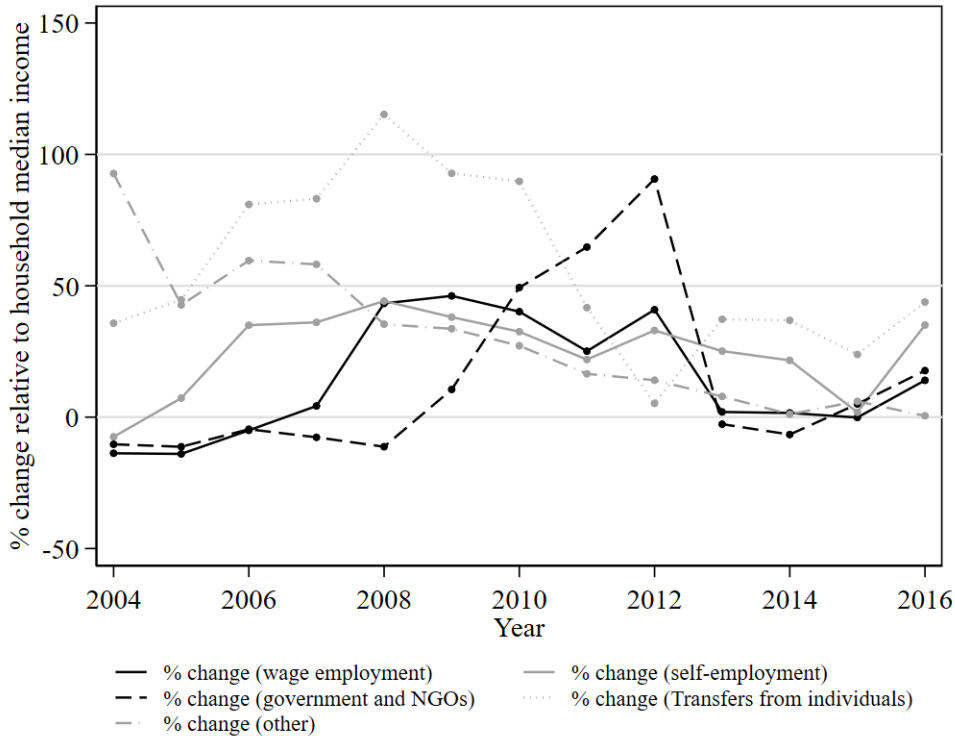
Source: Authors' calculations based on KIHS 2004–2016.
Notes: By definition, dummy—depart from household is missing in 2004 and 2013 as the sample was entirely new in each of these years, and household departure can only be observed when data are present in the prior year.

Figure A9: Distribution of income fluctuations

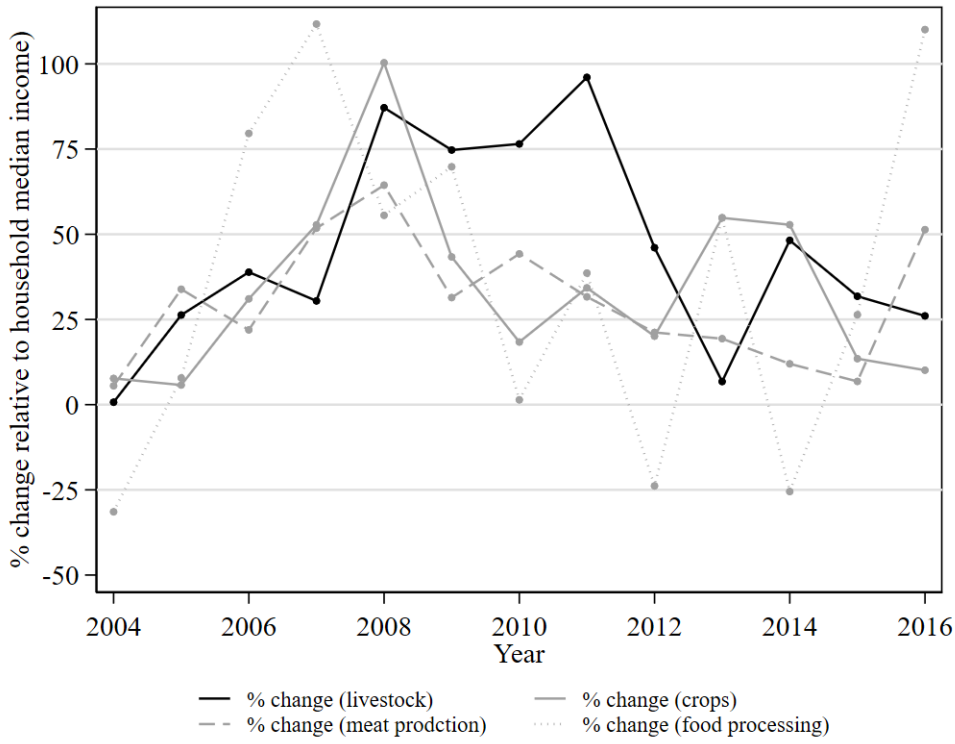


Source: Authors' calculations based on KIHS 2004–2016.
Notes: Zero indicates an income equal to the household-specific median income. For easier visualization, we exclude 1,078 household-year observations (1.83 percent of the full sample) that experienced an income fluctuation of over 100 percent. These large values, however, are retained in the empirical analysis, and in the average negatives/positives calculations plotted using vertical lines here.

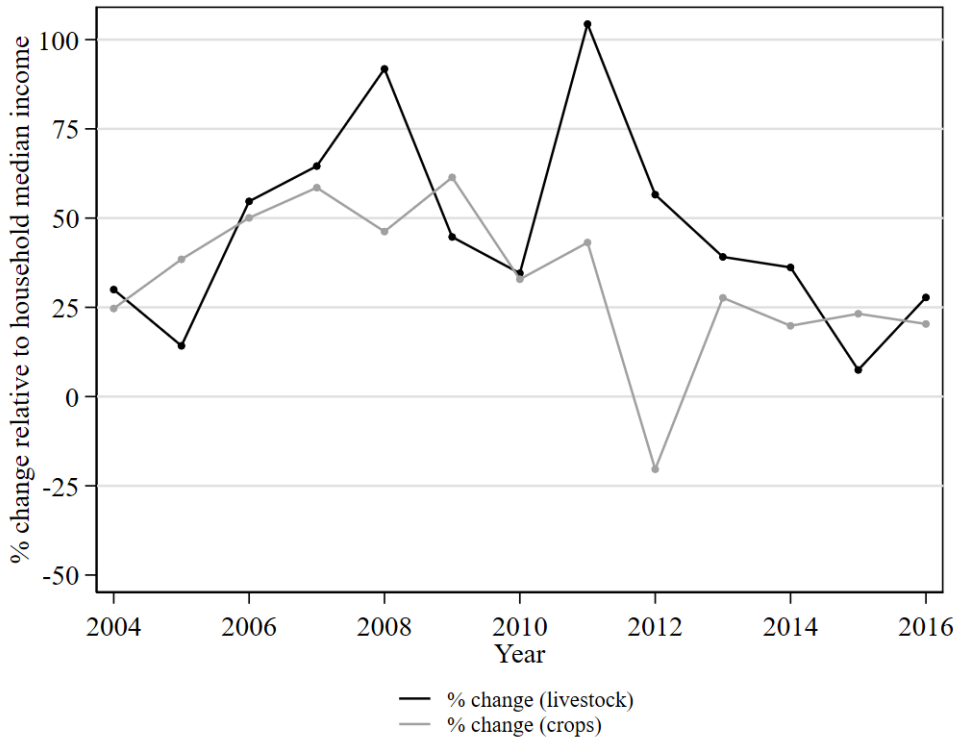
Figure A10: Average shock (percentage change relative to household-specific median) by income or cost sector and year



(a) Non-agricultural income



(b) Agricultural income



(c) Agricultural cost

Source: Authors' calculations based on KIHS 2004–2016.
Notes: Figures show the trends, for each sector separately, of the percentage change in income (or cost source) experienced in that year relative to the household-specific median.

Appendix C: Tests for plausibility of identifying assumptions

We follow Paul Goldsmith-Pinkham, Isaac Sorkin, and Henry Swift (2020) in recasting our Bartik instrument as an over-identified GMM estimator where the local shares (i.e., 9 distinct income sources) are treated as a set of individual instruments under a particular weighting matrix. The authors refer to these as Rotemberg weights. Along with their Rotemberg weights, the shares of income from different sources denote their contribution to the overall Bartik estimates. As such, the Rotemberg weights highlight the subset of instruments (shares) for which our estimates of the effects of predicted income on health-related outcomes are most sensitive to any potential endogeneity.

To compute the Rotemberg weights and associated statistics, we take household departure by 15–65 year olds as our outcome. Given the need for a common base year and a balanced panel for this analysis, we take 2004, the start date of our sample, and utilize data from households in the sample for all of 2004–2008. Table A10 presents this analysis; Panel A summarizes the total positive and negative weights; Panel B outlines the correlations of income source aggregates; Panel C displays variation across years in the sum and mean of weights; and Panel D provides the Rotemberg weights by income source. As Panel D shows, we find that three of our 9 sectors have particularly high Rotemberg weights: income from harvested crops, agricultural income from livestock, and agricultural income from food processing. These are sectors from which households on average earned 13.2 percent, 2.8, and 1.5 percent of their income at baseline, respectively (see Table A4). Thus, we find little evidence that a single sector accounts for the bulk of our identifying variation. Further, the majority of the Rotemberg weights are positive.

Following Goldsmith-Pinkham, Sorkin, and Swift 2020, it is helpful to explore the relationship between the composition of income sources and household characteristics that may be correlated with innovations to income shocks. Such estimates provide an empirical description of the variation and the types of mechanisms that may be problematic for our interpretation of the coefficient on predicted income as being due to fluctuations in income

themselves as opposed to the correlation of sector shares with household characteristics that predict changes in our main outcomes. Table A11 considers 7 household-level covariates; while many are statistically significant predictors of the three income shares with the highest Rotemberg weights, their effects are typically small and at times statistically insignificant. For example, having an additional working age (15–65) household member predicts a 2.0 percentage point increase in the share of income from harvested crops, a 1.0 percentage point increase in the share of income from livestock, and a 0.08 percentage point increase in the share of income from food processing. And having a household head who is 20 years old is associated with a 1.0 percentage point increase in the share of income from harvest crops, but no significance differences in the share of income from either livestock or food processing.

It would be worrying if household-level variables correlated with shares of income from sectors with high Rotemberg weights predicted changes in individuals' household departure or labor supply outcomes. As Paul Goldsmith-Pinkham, Isaac Sorkin, and Henry Swift (2020) eloquently put it, "the key question researchers should have in mind is whether the correlates of the levels of the shares predict changes in the outcome. For the empirical strategy to be valid, it is fine if the level of the correlates is related to the level of the outcome" (p. 2605). To explore this possibility, table A12 regresses changes in health outcomes during 2005–2008 on the 2004 levels of the seven household level covariates we considered in table A11. We include as outcomes departure from the household (column 1), the share of the year that one is employed (column 2), hours of employment (column 3), hours of home production (column 4), and other hours (column 5). This involves conducting 35 hypothesis tests; we would expect between 3 and 4 to yield statistically significant coefficients at the 10 percent level of significance or higher purely due to random chance. In total, we identify a somewhat higher, 13 statistically significant coefficients. However, the estimates are typically very small in magnitude. For example, four of our significant coefficients are for the household-level covariate, number of members younger than 15 years old. However, having an additional member under age 15 predicts only a 0.64 percentage point increase in the likelihood of

an individual departing from the household during 2005–2008, an additional 0.74 percent of the year being employed, and additional 0.10 hours per week less time spent on home production, and an additional 0.30 hours per week less time spent not working (i.e. on other things such as leisure). Overall, we take this evidence that correlates of the levels of our shares have limited predictive power over changes in our key outcomes, strengthening our confidence that we can consider the shares to be exogenous.

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