

Migration and the Informal Sector

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Abstract

We study the link between temporary international migration and informal economic activity in the home country using household level panel data from the world's most remittance dependent country, Tajikistan. We are interested in seeing whether migration and remittances are a substitute for informal sector activity or a complement.

There are hosts of classifications of what constitutes informal economic activity. Our approach to informality is grounded in a long discussion in development economics about what features are captured and missed in survey data when one uses expenditure versus when using income. We look at the gap between household reported income and reported expenditure. As with all surveys there are bound to be recollection issues but we argue that a large gap between reported expenditures and reported incomes suggests the presence of informal income.

We study the effect of migration in a causal framework on the gap. Our findings show that households with migrants exhibit significantly lower excess expenditure over income, our measure of informal sector activity, than non-migrant households. This holds, in particular, for remittance-receiving households. Households with current migrants and households with several migrants have significantly lower informal activity than non-migrant households or households that have migrants that have already returned home for whom no migrant is currently abroad.

Migration, as a channel of income remittances, and informal sector activity are indeed substitutes in the home country.

Key words: income, expenditure, informal, migration, remittances

JEL Codes: O17, J61, P23

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1. Introduction

This paper examines the link between temporary international migration and informal economic activity in the home country using household level panel data. Our understanding of what constitutes informal economic activity is very broad. Among these, it can denote employment in enterprises that do not have access to formal capital markets or operates below some minimal physical capital stock level. It may refer to the unmeasured economy where workers do not formally disclose their earnings to the tax authorities. It could denote employment in small firms with less than some small number of workers. Variants of these definitions have been used in the literature and in this paper we do not attempt to clarify these definitions.

The informal sector plays various economic roles. For some the informal sector is bad in the sense that workers in the informal sector are not covered by legal protections that workers in the formal sector face (Guha-Khasnobis and Kanbur, 2006). It can be “murky” sometimes acting as a staging ground for workers looking to advance (Fields, 1975; Gang and Gangopadhyay, 1990). Others have shown (see for example Dimova, Gang and Landon-Lane, 2006) that the informal sector can play a role as a safety net in periods of economic stress and crisis (Amir and Barry, 2013). The informal sector in periods of crisis can be flexible enough to quickly handle large numbers of workers displaced from the formal sector and can help mitigate the drop in household income that accompanies such dislocation.

This paper looks at the tradeoff between migration and informal sector activity. In particular, we look at the role international migration and their consequent remittances have on a household’s decision to work in the domestic (home country) informal sector. Migration, particularly temporary migration, and remittances are typically measured and households who send a member out of the country to work are doing so in the knowledge that the tax authorities will see this income. We are interested in seeing whether migration and remittances are a substitute for informal sector activity or a complement.

To do this we study Tajikistan, a country that has a very large share of its households receiving remittances from members working outside of the country. We use an innovative approach to measure the informal economy with household expenditure and income surveys. Our approach is to look at the difference in household reported income and reported expenditure. As with all surveys there are bound to be recollection issues but we argue that large differences between reported expenditures and reported incomes suggest the presence of non-formal income. We are confident that this gap is due to the presence of informal income as the definition of income in the survey includes questions on consumption and savings, and consumption of household assets. Our approach is to argue that households when reporting their income only report their formal income – the income they reported to the authorities. However, when they report their expenditures on the different consumption categories households do not go out of their way to align their expenditures with their “reported” income. The benefits and issues of this approach are

related to the extensive discussion over using expenditure versus income in poverty measurement (Deaton, 1997).

With this measure of the size of each household's informal activity we investigate the impact that migration has on informal sector activity. This paper considers the influence international migration has on households' informal sector activity as captured by the gap between expenditure and income for households. The gap households' face between their expenditures and income is the subject of intrinsic interest and intensive inquiry. We push its study a bit further and particularly want to understand the relationship between this gap and migration in a causal framework.

Specifically, we are interested in whether migration is a substitute or a complement for informal sector activity. That is, do households with migrants adjust their informal sector activities or does migration with its consequent remittances occur on top of informal sector activities. Is migration a substitute or complement for domestic economic activity? Which households are affected and why? To close in on answers we employ a conceptual framework which begins by thinking about what an ideal experiment would look like. Unfortunately, we do not have a lottery or a natural experiment. Instead, we construct an alternative approach which still provides a measure of the *causal* effect of migration on household informal activity as captured by the expenditure-income difference.

Understanding the household variation in this discrepancy is key to our analysis. We are especially interested in comparing households containing migrants to those that do not. What is it that we are capturing when looking at the gap between expenditure and income? Many data sets contain information on both household expenditure and income. Conceptually, if fully accounted for they should be equal. That they are not may be a matter of recall, comfort with reporting accurate expenditures in contrast to income, corruption, and informal sector work which frequently goes unreported and forgotten, among other explanations. There is also difficulty with the appropriate unit of analysis; often assignment of unreported income assumed to close the gap is to those persons identified as working in the household, though it is really impossible to make such an assignment. Because of this we use the household as the unit of analysis. While relevant decisions are made jointly as well as individually, it is not possible in surveys to perfectly assign income and expenditure individually. At minimum, there are too many joint goods.

Our strategy allows us to offer alternative interpretations of the expenditure – income gap, for example corruption (Gorodnichenko and Peter, 2007), or the shadow economy (Torosyan and Filer, 2014; Filer, Hanousek, and Lichard, 2015). Our approach allows the use of the rich trove of survey data to examine the expenditure-income gap, whatever it is reflecting in household behavior, and its links to other aspects of the economy. By examination of the discrepancy between stated expenditures and stated income, in order to assign households to behavioral groups detailed data on firm characteristics, social security coverage, or similar information is not needed in our line of attack.

Our analysis shows that migration is indeed a substitute for informal sector activity. Households actively receiving remittances have a significantly lower expenditure-income gap. This suggests that informal sector activity is not primarily aimed at reducing the tax burden but rather as an extra form of income needed in dire economic times.

The outline of the remainder of this paper is as follows: Section 2 provides a detailed discussion of our measure of a household's informal activity and background information on our country case Tajikistan. Section 3 outlines the data used in this study. Section 4 contains our empirical analysis and discussion while section 5 expands the analysis to numerous robustness tests. Section 6 takes up the question of what the gap between household income and expenditure is actually capturing. Finally, in section 7 we conclude.

2. Measuring Informal Sector Activity and Background in Tajikistan

2.1 How to Measure the Informal Sector

There is a large and growing literature on how to measure the informal sector in its various forms and to attempt to understand its dynamics (Schneider and Enste, 2000; Maloney, 2004). In our paper we employ household survey data from the World Bank's Living Standard Measurement Survey (LSMS) for Tajikistan and the similarly structured Tajikistan Household Panel Survey (see data section below). Such surveys ask detailed questions of households about their income sources and expenditures that we use to look for evidence of informal sector activity. The data provides detailed information on all financial flows into and out of a household. We use this data to compute total expenditures and total income for a household. The difference between expenditures and households are our measure of informal sector activity. While there is bound to be measurement and recall error in such surveys it is also normal to see very large discrepancies between reported expenditures and reported income. It is difficult to believe that the large discrepancies are due solely to measurement and recall error.

This approach of using the discrepancy between reported expenditures and reported incomes was first used in Dimova et. al. (2006). In that paper the authors used the LSMS data for Bulgaria and found significant differences between expenditures and incomes. In particular, they found a large number of households reporting expenditures more than double the reported income. As a check to make sure this was not pure measurement error or due to inflation of consumer prices the authors studied households whose head was occupied in the professional sector and households that were populated by a single person. It was found that for those households the reported expenditures were only a few percentage points higher than the household's reported income. Thus, it would seem that small differences in reported expenditures and incomes could be explained by other factors, while large deviations between reported expenditures and income cannot be solely explained by measurement errors, recall errors or differences in the effect that

inflation has on incomes and expenditures. The literature has argued that households report expenditures with better accuracy than income and we use this as the basis of our measure of informal sector activity (Deaton, 1997). We argue that when faced with the detailed nature of expenditure questions in the survey, households do not internally account for incomes they did not report. While it is easy to only report their formal income it is hard to make sure that the amount is reported on the expenditure side.

Moreover, the LSMS have very detailed information on all sources of income and expenditures which allow us to make sure the discrepancy between expenditure and income is not due to ignoring consumption of household capital or the running down of savings. For example, the survey data allow us to calculate a household's total expenditure including its total expenses on goods and services, the market value of in-kind goods and services and assets consumed, and asset accumulation (savings). Included in total household income are earnings (both in-kind and regular), net transfers from government agencies, remittances from household members, the market value of in-kind goods and services and assets consumed. For each household in our estimations monthly equivalents are used for all income and expenditure variables. Home production or the lack of measuring home production is accounted for here in that the market value of home production (e.g. growing and eating your own food) is included in both expenditures and income. Changes in a household's asset stock are also accounted for in income so that any discrepancy between expenditure and income is not due to the consumption of capital (eating the household cow) or the running down of savings.

We have carefully used responses to properly account for non-market consumption and income and are confident that the resulting discrepancy between reported expenditures and reported incomes are a good indicator of unreported activity. A significant proportion of this unreported activity is informal sector activity. Our empirical strategy utilizes the changes in the difference between expenditures and incomes as a way of measuring the impact migration has on informal sector activity. Since remittances are measured and hence included in income we can use the change in the discrepancy between expenditures and incomes across households with remittances and without remittances as a way to test whether remittances are a substitute or a complement to informal sector activities. If we see no difference in the expenditure/income discrepancy across households with and without remittance income, then temporary migration is a complement to informal sector activity. If we see a decline in the expenditure/income discrepancy for households with remittance income compared to households without remittance income, then this is evidence that temporary migration is a substitute for informal sector economic activity. It would also be evidence in favor of the argument that informal sector acts as a buffer when times are bad: in bad times we expect income and expenditure to fall, but the latter not as much. Finally, it would also be indirect evidence that the expenditure/income discrepancy is indeed measuring informal activity rather than illegal activity as we would not expect a big change in the expenditure/income discrepancy if the discrepancy was due to illegal or illicit activity.

We next describe the background in the context of Tajikistan, thereafter the data used in

this paper and our empirical methodology.

2.2 Background on Tajikistan

Our empirical work examines international migration and the expenditure-income gap for Tajikistan. More than half of its 2012 GDP came from the 37% of its labor force working abroad, making it the world's most remittance dependent country. Estimates are that informal activity makes up half of nonagricultural employment and that in 2006 61% of GDP was from the shadow economy. We study Tajikistan, a poor former Soviet Republic located in Central Asia. Tajikistan suffered severe economic, social and political changes following the USSR's collapse. The breakup of the Soviet Union ruptured economic ties. A civil war among rival regional clans from 1992 to 1997 was followed by an initially tenuous peace. By 1997 GDP had fallen to 35% of its 1990 level and inflation was at 65.2% (World Bank, 2011). Soon after the peace agreement and formation of the joint government in 1997, new economic policies were put in place. Annual real GDP grew at an 8.8% average rate from 2001-2010; average annual inflation was 20.7% (World Bank, 2015). Even with these successes, Tajikistan is still economically trailing other former USSR countries, having the worse poverty rate and lowest GDP per capita. GDP per capita was US\$820 in 2010 (for comparison, in the Russian Federation – US\$10,481); poverty by the headcount ratio was 47.2% in 2009 (World Bank, 2015). Compared to Russia in 2010 average monthly wages in Tajikistan were approximately 8.5 times lower (US\$82.90, Statistical Committee of CIS, 2011). Half of the working population of Tajikistan were employed in the traditional parts of the economy – agriculture, forestry and fisheries – where monthly wages were US\$23.60, \$39.10 and \$41.60, respectively (Statistical Agency of Tajikistan, 2011).

During the 2000's there has large scale migration of Tajikistan's labor force, mainly to large urban areas in Russia, with more than 50% going to Moscow.¹ Driven by large income and wage differentials, migration is largely seasonal and circular the median migration spell is about 7 months (Danzer, Dietz & Gatskova, 2013a) and only one-fifth of migrants stay abroad for over one year (Marat 2009). Tajiki migrants in the destination economy mainly work in low-skilled jobs in trade, services and construction. Typically, they work with other Tajiki's in jobs that are not attractive to natives (Marat, 2009). Their remittances home are critical to Tajikistan's economy. 78% living abroad remit, while 99% of returning migrants bring money home (THPS 2011). These remittances are used for basic necessities such as food, house renovations and celebrations such as weddings (THPS 2011). Very little is used to further schooling or household enterprises or businesses (Danzer, Dietz & Gatskova, 2013a).

¹ Abdulloev, Gang and Yun (2014) study the impact of massive migration on the domestic labor market in Tajikistan. See also Abdulloev, Gang and Landon-Lane (2012) and Ivlevs (2016).

3. Data and Empirical Methodology

3.1 Data

The data that we use in this paper are the 2007 and 2009 World Bank Living Standard Measurement Survey on Tajikistan² (TLSS) and the 2011 Tajikistan Household Panel Survey (Danzer, Dietz and Gatskova, 2013). The three years of data permit analysis of a panel. The 2007 TLSS interviewed 4860 households asking about schooling, well-being, employment and migration experience. A subsample of 1503 households were re-interviewed in 2009, while 1458 of the 2009 sample were included in the 2011 sample (Danzer et al. 2013b). The panel was created by starting with the 2011 households and variables, and matching the 2007 and 2009 information to these. All questions (including many migration-related questions) from 2011 were retained. Households and variables from the 2007 and 2009 surveys were retained only if included in the 2011 wave. Year-to-year panel attrition was small. From 2009 to 2011 only 45 households were lost in the main sample, indicating that despite the large in- and outflows of family members the core of the household was stable. The surveys are especially useful to us for they contain detailed information on resource flow into and out of households. As noted in Section 2 the income and expenditure variables include payments in kind and the running down of savings and the consumption of assets. Both income and expenditure variables are converted to monthly equivalents for each household and it is natural logarithm of the ratio of expenditure to income that is used in our analysis.

The dependent variable in our empirical work is the natural logarithm of the ratio of reported expenditures to reported income. Remittances from household members are included in income. Both expenditures and income variables are from self-reported information and include in-kind goods and services. Critical for this paper are the households whose income is less than expenditures. Looking at the sample means it is clear that this gap is largest for households without any migrants, suggesting that migrant remittances make up at least part of the gap. Looking at $\log(\text{exp})-\log(\text{inc})$ in Table 1, this is 1.294 in 2007, 0.873 in 2009, and 1.466 in 2011. Unreported income is quite large in Tajikistan.

In order to examine the varying household states with respect to international migration, we set up several different groups of migrants and non-migrants and assign households to them (Antman, 2015). We consider three different measures of a household having a migrant. We look

² For a detailed description of the TLSS 2007 sampling procedure see the basic information document of the survey: http://microdata.worldbank.org/index.php/catalog/72/related_materials. The survey data is based on a representative probability sampling on: (a) Tajikistan as a whole; (b) total urban and total rural areas, and (c) five main administrative regions (oblasts) of the country: Dushanbe (the capital), Regions of Republican Subordination (RRS), Sogd Oblast, Khatlon Oblast, and Gorno-Badakhshan Autonomous Oblast (GBAO).

at households who currently have a member who is currently abroad, we look at households who have a recently returned migrant, and we look at households that either currently have a migrant abroad or recently returned migrant. We label the last group as migrant families. These are our three characterizations of household's who have participated in international migration. To have a complete set of all possible household's migration status, we also will identify households with no international migration experience.

In addition to migration status we quantify a number of household characteristics. We measure the age of the head of household, the gender of the head, the education of the head, how many members of the household are below 15 and how many are above 65. We also include ethnicity, marital status and the location the household resides (urban or rural). Summary statistics for these variables can be found in Tables 1 and 2. In Table 1 we report sample averages by wave and by migration experience. In Table 2 we report sample averages by migration experience.

Figure 1 shows the kernel densities of log expenditure and log income by wave year and by migrant status. Looking at the graphs, the distribution of income is to the left of that of expenditure. While the distributions overlap, there are a considerable number of households with significantly higher reported expenditures than income.

Across the first row we have plotted these kernel densities by the different surveys years, 2007, 2009 and 2011. What becomes apparent is that across all years, the same pattern exists: expenditure is higher than income.

In the next four figures (the middle row plus the first figure in the third row) looks at households with differing migrant status. The kernel density of expenditure is always, albeit with varying degree, towards the right hand side of the kernel density of the distribution of income.

One could conclude that this pattern may be only visible in households with migrants and for this reason, we also look at households with no migration experience, the middle graph in the third row. Here, also we find that expenditure is higher than income, given the kernel densities. For this reason, we also compare the kernel densities for expenditure and income by households with migration experience and no migration experience at all (bottom right figure). It is apparent from these that the migrant distribution is slightly to the left of the non-migrant distribution. When compared to households that have no migration experience, migrant households have both higher mean income and expenditures.

The significance of the relationship of migration and the expenditure-income gap is a question, as we also find this gap in general for non-migration households. In our empirical section, we aim to test for this relationship.

3.2 Empirical Methodology

Here we sketch our estimation strategy and the thinking that lies behind it. We draw on the work by Antman (2015), who studies the impact that emigration by male household heads from Mexico to the United States has on intra-household allocation and distribution in Mexico. The emigrations we consider are not necessarily male nor are they strictly by household heads. We also account for differential impacts of current in contrast to recently returned migrants.

We want to understand the effects of migration on the difference between expenditure and income for the household. To pin this down we first think in terms of an ideal experiment, that is, a lottery or some random shock to the economy that would randomly provide an incentive for some households or members of some households for migration while for other households no one migrates. In this experiment one could take the difference between migrant households' expenditure and income and the respective calculation for households without migrants as an estimate of the causal effect of migration on the expenditure-income difference. Unfortunately, as we do not have a lottery (Gibson et al. 2011) or a random shock such as a quasi-experiment or a Mariel-type-boatlift (Card, 1990) to create an experimental setup that randomly assigns households into treatment and control groups, we cannot just calculate this difference and conclude that we have an unbiased causal estimate of the effect of migration.

There are several problems with such a non-randomized set-up. First, we may have selection bias. Households that send migrants might select into migration according to unobserved factors that may also affect income and expenditure and thereby affecting our informal sector measure of the log ratio of expenditure and income. Second, confounding factors may be an issue as households that send migrants might be systematically different than non-migrant sending households, e.g. in terms of education, age etc. This could be a concern if it affects migrant sending households differentially than non-migrant sending households. These confounding factors can be observable and unobservable. We can control for the observable ones. Third, in the case of our panel we may have differential effects across the three waves. Households may experience different shocks over time and therefore adjust their expenditures. This would not necessarily be adjusted for by our different household comparisons groups estimation, or by fixed effects estimation. We can include year dummies to control for this potential. And finally there is a remittances issue. The consideration of remittances is often problematic as it is often not clear who is actually sending the remittances, and there are questions about their form and timing. We account for remittances in a robustness check of our results.

The hypothetical experiment outlined above can provide us with an identification strategy. It allows us to create, step-by-step as in Antman (2015), a model measuring the effect of migration on the difference between a household's expenditure and income and to interpret the coefficient on migrants as a potentially causal effect of migration. We use the log ratio of expenditure to income as the dependent variable.

To start with we select the sample of households having migration experience, whether a currently abroad or a returned migrant or both present in the family. This way we are able to account for self-selection based on unobserved factors that might have led to migration and that may be correlated with our excess expenditure over income measure. Initially our sample includes three groups of households which either have migrants currently abroad or with returned migrants or have a combination of both present in the household, but we do not include households that have no migrants or migration experience. In other words, here we are looking at the universe of households who are currently or in the past had a member who migrated abroad.

Our cross-section model is, with no control variables:

$$Y_{it} = \alpha_0 + \alpha_1 CurrMig_{it} + \varepsilon_{it}, \quad (1a)$$

$$Y_{it} = \alpha_0 + \alpha_1 ReturnMig_{it} + \varepsilon_{it}, \quad (1b)$$

$$Y_{it} = \alpha_0 + \alpha_1 MigrantFamily_{it} + \varepsilon_{it}, \quad (1c)$$

where Y_{it} is the dependent variable log expenditure minus log income, our measure of the informal sector.

For equation 1a, the independent variable is $CurrMig_{it}$ and takes the value 1 if the household has migrants currently abroad and value 0 if the household has returned migrants/households with any migration experience (but no current migrant). The index i is the household and the index t is the survey year (2007, 2009, 2011). Then α_1 is the main coefficient that we are interested in and would tell us the effect of having a current migrant abroad on the gap (or for equation 1b and 1c this differs). As we are comparing current migrant households to other migrant households the issues of selection into migration based on unobservable characteristics may be of lesser importance as we only look at the universe of migration. This is because we are comparing only households that have selected into migration (this is our universe, initially) and we estimate within them the difference between having currently abroad, already returned migrants ($ReturnMig_{it}$) or having both types of migrants, returned and current migrant in the household ($MigrantFamily_{it}$). Equations (1b) and (1c) estimate the effect of $ReturnMig_{it}$ and $MigrantFamily_{it}$ on Y_{it} , the informal sector outcome variable, within the universe of migrant households.

Once we have tested how different forms of migration within a household affect the informal sector we also need to consider the universe of non-migrants.

Restating from above, we think about a set-up where there are four groups of households covering the migrant universe and the non-migrant universe:

- (a) Households with migrants abroad ($CurrMig_{it}$).
- (b) Households with migrants returned ($ReturnMig_{it}$).
- (c) Households with migrants abroad and returned migrants ($MigrantFamily_{it}$).
- (d) Household with no migration experience.

The advantage with this model is that we can use the full sample, including not only households with migrants abroad, households with returned migrants, those with migrants both abroad and returned but also households that have no migrants. This can add to our estimation, as we were able to estimate the difference within migrant universe households and non-migrant households. We combine (1a), (1b) and (1c) into equation (2) and now no-migrants form the omitted category:

$$Y_{it} = \beta_0 + \beta_1 CurrMig_{it} + \beta_2 ReturnMig_{it} + \beta_3 MigrantFamily_{it} + \varepsilon_{it}. \quad (2)$$

This empirical strategy provides us with a comparison of the different groups. Issues of migration selection and confounding factors might be still there, so we include covariates to control for observable confounding factors (equation (3)) and also household fixed effects regressions (equation (4)),

$$Y_{it} = \beta_0 + \beta_1 CurrMig_{it} + \beta_2 ReturnMig_{it} + \beta_3 MigrantFamily_{it} + X_{it}\delta + \varepsilon_{it}. \quad (3)$$

The variables that make up X_{it} are additional controls such as age, gender of the household head, ethnicity of the household head, location of household (urban), education level of the household head, number of children under age of 15 and number of household members over 65 and remittances.

Cross-sectional regressions are implemented on three waves of panel with cluster standard errors at the household level. We also include household fixed effects in our regression to account for potential unobserved household characteristics that drive migration and return migration.

$$Y_{it} = \beta_0 + \beta_1 CurrMig_{it} + \beta_2 ReturnMig_{it} + \beta_3 MigrantFamily_{it} + X_{it}\delta + \omega_i + \varepsilon_{it}, \quad (4)$$

where ω_i is the household specific error term which is time-invariant.

4. Empirical Results

Equations (1) through (4) were estimated using ordinary least squares with cluster robust standard errors. Equations (1) – (3) were estimated as a pooled regression while equation (4) was estimated as a fixed effects panel regression. In all equations the dependent variable is the natural logarithm of the ratio of reported household expenditure to reported household income. That is, $Y_{it} = \log(\text{Expenditure}_{it}) - \log(\text{Income}_{it})$.

Tables 3 - 5 contain estimation results for the variants of equation (1). The population considered in these regressions is all households with migrants. There are three groups: households with current migrants, households with recently returned migrants, and family migrant households (those with both current and past migration). Households with no migration experience are not included in these regressions. This set of estimations helps to determine the difference in the dependent variable within the migrant household universe, whereby we distinguish between different types of migrant households.

Table 3 reports the results for equation (1a) and for equation (1a) with controls added. Recall that equation (1a) measures the difference in the log ratio of expenditure and income across two groups: those households who currently have a migrant abroad and those households who instead have a recently returned migrant or both a recently returned migrant and a current migrant abroad. The first column in Table 3 reports the simple linear regression and shows that households with a current migrant have a significantly lower expenditure to income gap than the base group. This result also holds up when we add controls. Controlling for age, gender, education, ethnicity, number of children in the household, number of old-aged persons in the household we get a difference of -0.35 log points between households with a current migrant and the base group. The mean log ratio of expenditure to income across the three years of the sample is 1.19 which is equivalent to a ratio of expenditure to income of approximately 3.3. Thus households with a current migrant have on average a ratio of expenditure to income of 2.31 compared to 3.3 for the overall group. The impact is sizeable and of the order of reported income. The final two columns of Table 3 break the sample into an urban sample and a rural sample. For the urban sample the impact of having a current migrant is insignificant and small whilst the impact of having a current migrant for a rural household is significant and large.

Tables 4 and 5 do the same as Table 3 except the control group are households with a recently returned migrant (Table 4) or households with both current and a returned migrant in the past (Table 5). In Table 4 we get consistent results that are positive and significant on the variable ReturnMig_{it} while in Table 5 we get consistent and negative coefficients on $\text{MigrantFamily}_{it}$. The positive coefficient on ReturnMig_{it} suggests that having a current migrant is better in terms of

remittances than having a migrant in the past. Households with a returned migrant are no longer receiving remittances and so can crowd out less informal sector income than those households who are currently earning income abroad.

However, the most interesting comparison is between households that have some migration experience and those households that have no migration experience. Our hypothesis is that remittances earned by a household member working abroad substitutes for informal sector income which implies that households with migration experience should have a lower ratio of expenditure to income. We test this hypothesis using regression equations (2) and (3). The results from pooled estimation for equations (2) and (3) can be found in Table 6. Column 1 of Table 6 reports the results from estimating equation (2) which is a comparison of the expenditure/income ratio without any controls. In columns (2) – (4) controls are added. In all regressions the base group consists of households that have no migration experience. The estimated coefficients for the three migrant households, $CurrMig_{it}$, $ReturnMig_{it}$, and $MigrantFamily_{it}$ are all negative and significant. Moreover, the relative magnitudes of these coefficients are in line with the reported results from Tables 3 - 5. The biggest reduction in the expenditure to income ratio can be found in households that contain a current migrant, either only as current migrant or in a so-called migrant family setting. However, all households that either have a current migrant or a recently returned migrant show a significantly lower expenditure to income ratio compared to households that have no migration experience. The impact is quite large with households with a current member abroad having expenditure to income ratio that is approximately 0.9 log points lower than households without any migration experience. For example, if a household had an expenditure to income ratio of 3 before sending a member abroad they would have an expenditure to income ratio of approximately 1.3 while the household member is abroad. If a household has a member currently abroad the impact on the expenditure to income ratio is also robust to whether the household is from an urban region or a rural region. The only category that is impacted by location is households with a recently returned migrant. In urban areas there is little difference between those households and household who have no migrants. One reason for this might be that in urban areas living expenses might be high enough that any savings brought back from overseas are quickly depleted thus making households with a returned migrant similar in nature to households who never had migration experience.

Finally, in an attempt to control for household characteristics that are both observed and unobserved we estimate equation (4) which is to estimate a fixed effects version of equation (3). These results can be found in Table 7. We report two sets of results for the fixed effects regressions: one without time effects and one with time effects. As before, we find that there is a significant impact on the natural logarithm of the ratio of expenditure to income of having a migrant currently abroad. The coefficient is negative and significant. The magnitude varies from approximately -0.5 to -0.7 depending on whether we add time effects into the regression. Even with a value of -0.5 we see a large drop in the ratio of expenditure to income from 3 to 1.8, a drop of more than reported income.

Our results do confirm our suspicion that there is a large informal sector in Tajikistan and that the difference between reported expenditures and reported incomes captures informal sector activity. Households that send a household member abroad on average have a lower ratio of expenditure to income which suggests that migration and the earning of remittances are a substitute for informal sector activity. Before discussing our results in more detail we outline results of some robustness checks that were carried out.

4.1 Robustness Checks

We performed a number of robustness checks to our regressions. First, we were concerned whether the dependent variable of our informal sector activity might be driven by certain segments in the distribution. For instance, that outlier or higher quantiles of the income-expenditure gap might be mainly drive the results. We re-estimated equation (3) using quantile regression with thresholds set to 0.25, 0.5 and 0.75 respectively. The results from these quantile regressions can be found in Table 8. The results are quite consistent across the different conditional percentiles that were used and are similar in magnitude to the results from using OLS. This is evidence that the results that we obtained above were not due to outliers. The main result is that households with a current migrant have economically and statistically significant lower ratios of expenditures to incomes compared to households that do not have a migrant.

The second robustness check is to look at households that report a positive amount of remittance income, a possible channel on why we observe the results that we do. That is, we only consider households to have a migrant abroad if they are receiving remittance income. Households who currently have a migrant abroad but are not receiving remittance income are moved to the base group with households without any migrants. The estimation results for this alternative definition can be found in Table 9. Again we find statistically and economically significant declines in the ratio of household expenditures to incomes for households that currently have a migrant abroad compared to households that don't have a migrant abroad. The magnitudes are slightly higher confirming our suspicion that the presence of remittances is important in crowding out informal sector activity and a likely channel to explain our results.

5. Conclusion and Comments

In this paper we have investigated the relationship between informal sector activity and migration. We use differences in reported expenditures and reported incomes to infer informal sector activity using income and expenditure surveys and found that for Tajikistan there were large discrepancies between reported expenditures and reported incomes. These discrepancies could be due to a number of things including informal sector activity. Our hypothesis is that households are not using informal sector activity to hide income from authorities but rather as a buffer in bad economic times. We expect, therefore, to see remittances crowding out informal sector activity in our data. Implicit in this expectation is our belief that temporary migration with the intention of

earning money to be remitted back home is a substitute for informal sector activity at home. The big difference between the two sources of income is that remittances are largely recorded while informal sector activity is not. Under this scenario we would expect to see households with a migrant abroad having a smaller expenditure over income discrepancy.

Using income and expenditure data from Tajikistan for the years 2007, 2009 and 2011, we test this. These years are economically difficult years for Tajikistan and so we would expect to see a sizeable amount of a household's income coming from informal sector activity. In the data we do see large discrepancies between income and expenditures with expenditures being on average three times reported incomes over this period. Tajikistan is also interesting in that there is a very large temporary migration out of Tajikistan and into Russia at this time. We broke the households in the sample into households that have a current migrant, households that had a recent migrant, households that have both a current migrant and a recent migrant, and households that have no migration experience. In estimating the difference in excess expenditure across these households controlling for observed and unobserved household characteristics, we find significantly lower excess expenditure over income for households with a current migrant. The impact of migration status on the discrepancy is large. This result is robust to a number of different specifications.

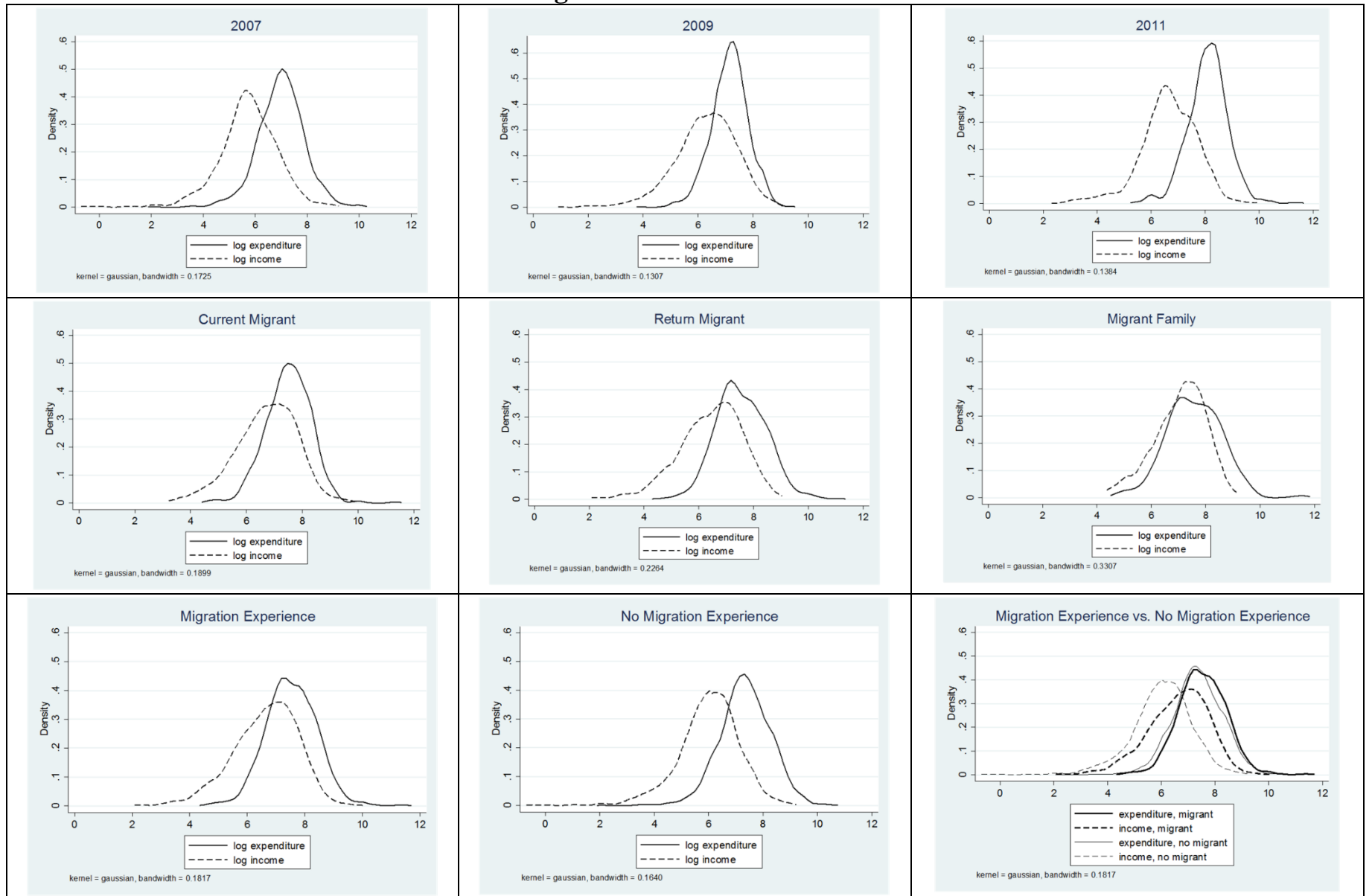
The argument put forward is that a large part of the disparity between expenditure and income that observed in Tajikistan is informal sector activity. Also, this informal sector activity is not an attempt to hide income but rather a safety net or buffer from difficult economic conditions. An alternative to informal sector activity is the earning of income abroad and remitting it back. This alternative is a substitute for informal activity. Our results show that the informal sector can be large and can act as a buffer or safety net during difficult economic times. We also argue that our results show that informal sector activity is not necessarily synonymous with illegal activity. When households have a chance to earn formal income they do so and then report it.

References

- Abdulloev, I., Gang, I. N., & Landon-Lane, J. (2012). Chapter 6 Migration as a Substitute for Informal Activities: Evidence from Tajikistan, in Hartmut Lehmann, Konstantinos Tatsiramos (ed.) *Informal Employment in Emerging and Transition Economies (Research in Labor Economics, Volume 34)*, Emerald Group Publishing Limited, pp.205-227.
- Abdulloev, I., Gang, I. N., & Yun, M. S. (2014). "Migration, education and the gender gap in labour force participation." *The European Journal of Development Research*, 26(4), pp. 509-526.
- Amir, O. & Berry A. (2013). "Challenges of Transition Economies: Economic Reforms, Emigration and Employment in Tajikistan." *Social Protection, Growth and Employment* 157.
- Antman, F. M. (2015). "Gender discrimination in the allocation of migrant household resources." *Journal of Population Economics*, 28(3), pp. 565-592.
- Card, D. (1990). "The Impact of the Mariel Boatlift on the Miami Labor Market." *Industrial and Labor Relations Review*, 43(2), pp. 245-257.
- Danzer, A. M., Dietz, B., & Gatskova, K. (2013a). Tajikistan household panel survey: migration, remittances and the labor market: Survey report. IOS-Regensburg. http://www.ios-regensburg.de/fileadmin/doc/VW_Project/Booklet-TJ-web.pdf [Accessed: 05 December 2014].
- Danzer, A. M., Dietz, B., & Gatskova, K. (2013b). Migration and remittances in Tajikistan: survey technical report. <http://ideas.repec.org/p/ost/wpaper/327.html> [Accessed: 05 December 2014].
- Deaton, A. (1997). *The analysis of household surveys: a microeconomic approach to development policy*. World Bank Publications.
- Dimova, R., I. Gang, and J. Landon-Lane (2006). The Informal Sector during Crisis and Transition. in Guha-Khasnobis B. and R. Kanbur (eds) *Informal Labour Markets and Development*, Palgrave-McMillan Press, 88-108.
- Fields, G. (1975). "Rural-urban migration, urban unemployment and underemployment, and job-search activity in LDCs." *Journal of Development Economics*, Elsevier, vol. 2(2), pp.165-187.
- Filer, R., Hanousek, J., & Lichard, T. (2015). Measuring the Shadow Economy: Endogenous Switching Regression with Unobserved Separation (No. 10483). CEPR Discussion Papers.
- Gang, I. N., & Gangopadhyay, S. (1990). "A model of the informal sector in development. " *Journal of Economic Studies*, 17(5).
- Gibson, J., McKenzie, D., & Stillman, S. (2011). "The Impacts of International Migration on Remaining Household Members: Omnibus Results from a Migration Lottery Program. " *Review of Economics and Statistics*, 93(4), pp. 1297-1318.
- Gorodnichenko, Y., & Peter, K. S. (2007). "Public sector pay and corruption: Measuring bribery from micro data. " *Journal of Public Economics*, 91(5), pp. 963-991.
- Guha-Khasnobis B. and R. Kanbur (eds) (2006). *Informal Labour Markets and Development*, Palgrave-McMillan Press.
- Ivlevs, A. (2016). "Remittances and informal work", *International Journal of Manpower*, 37(7), pp. 1172-1190.
- Maloney, W. F. (2004). "Informality Revisited. " *World Development*, 32(7), pp. 1159–1178.
- Marat, E. (2009). Labor migration in Central Asia: Implications of the global economic crisis.

- Central Asia-Caucasus Institute. Silk Road Paper, May 2009. http://www.isdp.eu/images/stories/isdp-main-pdf/2009_marat_labor-migration-in-central-asia.pdf [Accessed 13 December 2015].
- Schneider, F., & Enste, D.H. (2000). "Shadow Economies: Size, Causes, and Consequences." *Journal of Economic Literature*, 38(1), pp. 77-114.
- Statistical Agency of Tajikistan. (2011). *Database*. Retrieved September 17, 2011, from Statistical Agency of Tajikistan: <http://stat.tj/ru/database/real-sector/>
- Statistical Committee of CIS. (2011). *Average Monthly Nominal Wage in the CIS Countries, in national currency*. Retrieved September 17, 2011, from Statistical Committee of CIS: <http://www.cisstat.com/index.html>
- Torosyan, K., & Filer, R. K. (2014). "Tax reform in Georgia and the size of the shadow economy." *Economics of Transition*, 22(1), pp. 179-210.
- World Bank. (2011). *Migration and Remittances. Factbook 2011*. Second edition. Retrieved August 12, 2011, from World Bank: <http://siteresources.worldbank.org/INTLAC/Resources/Factbook2011-Ebook.pdf>
- World Bank. (2015). *World Data Bank*. Retrieved September 17, 2011, from World Bank: <http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2>

Figure 1: Kernel Densities



Tables

Table 1: Summary Statistics

	2007	2009	2011	Current Migrant	Return Migrant	Migrant Family
log expenditure	7.016 (0.876)	7.170 (0.664)	8.115 (0.729)	7.510 (0.790)	7.597 (0.914)	7.541 (0.972)
log income	5.722 (1.167)	6.298 (1.115)	6.648 (1.042)	6.732 (1.094)	6.434 (1.158)	7.039 (0.956)
log(exp)-log(inc)	1.294 (1.270)	0.873 (1.079)	1.466 (1.098)	0.778 (1.061)	1.163 (1.316)	0.502 (1.061)
Age	51.042 (12.711)	52.819 (12.717)	54.341 (12.741)	54.213 (12.151)	52.004 (12.427)	52.035 (11.549)
Gender	0.171 (0.376)	0.163 (0.369)	0.251 (0.434)	0.341 (0.474)	0.123 (0.329)	0.285 (0.453)
Married	0.825 (0.380)	0.807 (0.395)	0.781 (0.414)	0.790 (0.408)	0.845 (0.363)	0.826 (0.380)
Ethnicity	0.225 (0.418)	0.248 (0.432)	0.227 (0.419)	0.250 (0.433)	0.279 (0.449)	0.229 (0.422)
Number of children 0-14 in a hh	2.232 (1.728)	2.220 (1.712)	2.101 (1.781)	1.924 (1.700)	2.625 (1.823)	2.063 (1.707)
Number of people (>65) in hh	0.275 (0.551)	0.282 (0.560)	0.284 (0.556)	0.253 (0.518)	0.239 (0.525)	0.146 (0.373)
Below Secondary Education	0.188 (0.391)	0.203 (0.402)	0.183 (0.387)	0.196 (0.397)	0.184 (0.388)	0.236 (0.426)
Complete Secondary Education	0.374 (0.484)	0.359 (0.480)	0.410 (0.492)	0.446 (0.497)	0.386 (0.487)	0.500 (0.502)
Above Secondary Education	0.438 (0.496)	0.438 (0.490)	0.407 (0.492)	0.358 (0.480)	0.430 (0.496)	0.264 (0.442)
Urban	0.352 (0.478)	0.336 (0.473)	0.330 (0.470)	0.358 (0.429)	0.188 (0.391)	0.215 (0.412)
Observations	1,131	1,193	1,252	581	560	144

Note: Mean, Std. Deviations in parentheses; Samples with no missing observations.

Table 2: Sample Averages by Migration Experience

	Current Migrant			Return Migrant			Migrant Family		
	(1) Yes	(2) No	(3) Diff	(4) Yes	(5) No	(6) Diff	(7) Yes	(8) No	(9) Diff
Age	54.213	52.514	-1.700	52.004	52.936	0.932	52.035	52.821	0.787
	0.504	0.236	0.579	0.525	0.234	0.588	0.962	0.219	1.088
Gender	0.341	0.168	-0.173	0.123	0.210	0.086	0.285	0.192	-0.092
	0.020	0.007	0.018	0.014	0.007	0.018	0.038	0.007	0.034
Married	0.790	0.806	0.016	0.845	0.796	-0.049	0.826	0.803	-0.024
	0.017	0.007	0.018	0.015	0.007	0.018	0.032	0.007	0.034
Ethnicity	0.250	0.230	-0.019	0.279	0.225	-0.053	0.229	0.234	0.005
	0.018	0.008	0.019	0.019	0.008	0.019	0.035	0.007	0.036
Number of children 0-14 in a hh	1.924	2.232	0.307	2.625	2.099	-0.526	2.063	2.187	0.124
	0.071	0.032	0.079	0.077	0.031	0.080	0.142	0.030	0.148
Number of people (>65) in hh	0.253	0.286	0.033	0.239	0.288	0.049	0.146	0.286	0.140
	0.022	0.010	0.025	0.022	0.010	0.026	0.031	0.010	0.047
Below Secondary Education	0.196	0.190	-0.006	0.184	0.193	0.009	0.236	0.189	-0.047
	0.016	0.007	0.018	0.016	0.007	0.018	0.036	0.007	0.033
Complete Secondary Education	0.446	0.369	-0.077	0.386	0.381	-0.005	0.500	0.376	-0.124
	0.021	0.009	0.022	0.021	0.009	0.022	0.042	0.008	0.041
Above Secondary Education	0.358	0.441	0.083	0.430	0.427	-0.004	0.264	0.434	0.170
	0.020	0.009	0.022	0.021	0.009	0.023	0.037	0.008	0.042
Urban	0.243	0.358	0.115	0.188	0.367	0.180	0.215	0.344	0.129
	0.018	0.009	0.021	0.017	0.009	0.022	0.034	0.008	0.040
Observations	581	2,995		560	3,016		144	3,432	

Note: Mean and Standard Error. Samples with no missing observations.

(1) Households with Current Migrant vs. (2) Household without Current Migrant.

(4) Households with Return Migrant vs. (5) Household without Return Migrant

(7) Migrant Family vs. (8) Not Migrant Family

Table 3: Estimation Results of Equation (1a): With and without controls

VARIABLES	(1)	(2)	(3)	(4)
	Pooled	Pooled controls	Pooled urban	Pooled rural
Current Migrant	-0.241*** (0.064)	-0.354*** (0.066)	-0.196 (0.136)	-0.394*** (0.077)
Age		0.003 (0.004)	-0.001 (0.008)	0.004 (0.004)
Gender		-0.208** (0.094)	-0.289* (0.164)	-0.193* (0.113)
Married		-0.036 (0.104)	0.009 (0.182)	-0.033 (0.128)
Ethnicity		-0.142** (0.066)	0.165 (0.149)	-0.193*** (0.074)
Number of children 0-14 in a hh		0.093*** (0.018)	0.064 (0.046)	0.098*** (0.019)
Number of people (>65) in hh		0.160* (0.085)	0.138 (0.184)	0.158* (0.096)
Complete Secondary Education		0.032 (0.103)	0.007 (0.206)	0.029 (0.119)
Above Secondary Education		0.024 (0.107)	-0.075 (0.194)	0.030 (0.129)
Urban		0.008 (0.076)		
year 2009		-0.574*** (0.090)	-0.286 (0.175)	-0.656*** (0.105)
year 2011		0.209** (0.082)	0.376** (0.150)	0.160* (0.097)
Constant	1.026*** (0.046)	0.862*** (0.260)	0.864* (0.511)	0.885*** (0.300)
Observations	1,306	1,285	277	1,008
R-squared	0.010	0.119	0.093	0.130

Note: dependent variable log difference of expenditure and income.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Estimation Results of Equation (1b): With and without controls

VARIABLES	(1)	(2)	(3)	(4)
	Pooled	Pooled controls	Pooled urban	Pooled rural
Return Migrant	0.438*** (0.066)	0.552*** (0.069)	0.406*** (0.156)	0.600*** (0.079)
Age		0.005 (0.004)	0.001 (0.008)	0.006 (0.004)
Gender		-0.122 (0.094)	-0.209 (0.164)	-0.108 (0.113)
Married		0.026 (0.104)	0.029 (0.180)	0.048 (0.128)
Ethnicity		-0.156** (0.066)	0.140 (0.145)	-0.207*** (0.074)
Number of children 0-14 in a hh		0.080*** (0.018)	0.049 (0.048)	0.086*** (0.019)
Number of people (>65) in hh		0.127 (0.085)	0.128 (0.183)	0.117 (0.096)
Complete Secondary Education		0.032 (0.101)	-0.040 (0.202)	0.044 (0.117)
Above Secondary Education		-0.008 (0.106)	-0.117 (0.192)	-0.002 (0.128)
Urban		0.007 (0.076)		
year 2009		-0.610*** (0.089)	-0.272 (0.176)	-0.715*** (0.104)
year 2011		0.201** (0.081)	0.436*** (0.154)	0.129 (0.095)
Constant	0.726*** (0.040)	0.354 (0.263)	0.542 (0.519)	0.309 (0.306)
Observations	1,306	1,285	277	1,008
R-squared	0.033	0.144	0.111	0.158

Note: dependent variable log difference of expenditure and income.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Estimation Results of Equation (1c): With and without controls

VARIABLES	(1)	(2)	(3)	(4)
	Pooled	Pooled controls	Pooled urban	Pooled rural
Migrant Family	-0.479*** (0.096)	-0.395*** (0.092)	-0.348* (0.197)	-0.419*** (0.106)
Age		0.001 (0.004)	-0.003 (0.007)	0.002 (0.004)
Gender		-0.304*** (0.092)	-0.330** (0.161)	-0.306*** (0.111)
Married		-0.079 (0.105)	-0.005 (0.178)	-0.098 (0.131)
Ethnicity		-0.144** (0.068)	0.152 (0.149)	-0.192** (0.075)
Number of children 0-14 in a hh		0.106*** (0.018)	0.077* (0.044)	0.110*** (0.020)
Number of people (>65) in hh		0.144 (0.088)	0.125 (0.186)	0.144 (0.099)
Complete Secondary Education		0.000 (0.101)	-0.038 (0.197)	0.001 (0.118)
Above Secondary Education		-0.025 (0.108)	-0.151 (0.187)	-0.002 (0.131)
Urban		-0.003 (0.077)		
year 2009		-0.494*** (0.087)	-0.204 (0.177)	-0.577*** (0.100)
year 2011		0.195** (0.079)	0.384*** (0.146)	0.144 (0.093)
Constant	0.971*** (0.035)	0.908*** (0.263)	0.932* (0.505)	0.931*** (0.307)
Observations	1,306	1,285	277	1,008
R-squared	0.016	0.112	0.096	0.120

Note: dependent variable log difference of expenditure and income.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Estimation Results of Equations (2) and (3)

VARIABLES	(1)	(2)	(3)	(4)
	Pooled	Pooled controls	Pooled urban	Pooled rural
Current Migrant	-0.593*** (0.051)	-0.738*** (0.052)	-0.481*** (0.090)	-0.836*** (0.062)
Return Migrant	-0.214*** (0.057)	-0.238*** (0.056)	-0.057 (0.123)	-0.296*** (0.063)
Migrant Family	-0.885*** (0.092)	-0.914*** (0.088)	-0.695*** (0.177)	-1.001*** (0.101)
Age		0.002 (0.002)	-0.001 (0.003)	0.003 (0.003)
Gender		-0.012 (0.068)	0.081 (0.105)	-0.102 (0.087)
Married		0.003 (0.070)	-0.015 (0.104)	0.021 (0.095)
Ethnicity		-0.162*** (0.042)	-0.020 (0.067)	-0.209*** (0.051)
Number of children 0-14 in a hh		0.061*** (0.011)	0.053*** (0.019)	0.069*** (0.013)
Number of people (>65) in hh		0.105** (0.046)	0.125 (0.085)	0.092* (0.055)
Complete Secondary Education		0.018 (0.059)	-0.073 (0.098)	0.036 (0.074)
Above Secondary Education		-0.007 (0.060)	-0.094 (0.095)	0.011 (0.077)
Urban		-0.271*** (0.041)		
year 2009		-0.425*** (0.047)	-0.274*** (0.070)	-0.507*** (0.061)
year 2011		0.257*** (0.046)	0.290*** (0.070)	0.245*** (0.059)
Constant	1.378*** (0.024)	1.321*** (0.155)	1.127*** (0.226)	1.337*** (0.207)
Observations	3,655	3,576	1,212	2,364
R-squared	0.050	0.139	0.086	0.160

Note: dependent variable log difference of expenditure and income.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Fixed effect Estimation Results of Equation (4)

VARIABLES	No Time Effects			Time Effects		
	(1)	(2)	(3)	(1)	(2)	(3)
	FE	urban	rural	FE	urban	rural
Current Migrant	-0.595*** (0.081)	-0.199 (0.143)	-0.743*** (0.096)	-0.735*** (0.076)	-0.307** (0.142)	-0.901*** (0.089)
Return Migrant	-0.307*** (0.083)	0.033 (0.180)	-0.404*** (0.095)	-0.233*** (0.079)	0.152 (0.171)	-0.342*** (0.090)
Migrant Family	-1.024*** (0.145)	-0.445 (0.319)	-1.202*** (0.158)	-1.010*** (0.135)	-0.405 (0.297)	-1.211*** (0.147)
Age	0.011*** (0.004)	0.015*** (0.006)	0.010* (0.006)	0.004 (0.004)	0.009 (0.006)	0.003 (0.006)
Gender	0.021 (0.115)	0.136 (0.175)	-0.027 (0.149)	-0.179 (0.114)	0.012 (0.172)	-0.285* (0.148)
Married	0.013 (0.127)	-0.009 (0.191)	0.011 (0.170)	-0.070 (0.121)	-0.092 (0.188)	-0.052 (0.159)
Ethnicity	-0.219* (0.128)	-0.235 (0.204)	-0.242 (0.159)	-0.082 (0.129)	-0.103 (0.202)	-0.098 (0.163)
Number of children 0-14 in a hh	0.015 (0.024)	0.030 (0.046)	0.016 (0.028)	0.023 (0.023)	0.020 (0.043)	0.034 (0.027)
Number of people (>65) in hh	0.133 (0.098)	0.474*** (0.177)	0.045 (0.118)	0.136 (0.094)	0.433** (0.167)	0.060 (0.113)
Complete Secondary Education	0.093 (0.086)	0.120 (0.158)	0.088 (0.102)	-0.012 (0.085)	0.109 (0.155)	-0.073 (0.100)
Above Secondary Education	0.084 (0.093)	0.296* (0.158)	0.011 (0.116)	-0.011 (0.091)	0.258 (0.158)	-0.118 (0.111)
year 2009				-0.453*** (0.048)	-0.325*** (0.071)	-0.540*** (0.063)
year 2011				0.248*** (0.048)	0.238*** (0.077)	0.242*** (0.062)
Constant	0.715** (0.291)	-0.012 (0.394)	0.990** (0.412)	1.301*** (0.284)	0.461 (0.395)	1.607*** (0.397)
Observations	3,576	1,212	2,364	3,576	1,212	2,364
R-squared	0.047	0.037	0.063	0.137	0.114	0.162
Number of hhid	1,332	450	882	1,332	450	882

Note: dependent variable difference in log of expenditure and log of income. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Quantile Regression Results for Equation (3)

VARIABLES	(1) 0.25	(2) 0.5	(3) 0.75
Current Migrant	-0.724*** (0.074)	-0.643*** (0.045)	-0.696*** (0.066)
Return Migrant	-0.381*** (0.078)	-0.203*** (0.066)	0.084 (0.086)
Migrant Family	-0.705*** (0.098)	-0.819*** (0.076)	-0.873*** (0.129)
Age	0.001 (0.002)	0.002 (0.002)	0.002 (0.002)
Gender	-0.038 (0.077)	0.001 (0.085)	0.160 (0.108)
Married	0.011 (0.091)	0.026 (0.085)	0.177 (0.112)
Ethnicity	-0.125** (0.055)	-0.082** (0.040)	-0.110* (0.060)
Number of children 0-14 in a hh	0.069*** (0.013)	0.066*** (0.011)	0.063*** (0.012)
Number of people (>65) in hh	0.091 (0.058)	0.104** (0.042)	0.156*** (0.050)
Complete Secondary Education	-0.025 (0.077)	-0.049 (0.051)	-0.017 (0.075)
Above Secondary Education	-0.032 (0.069)	-0.096** (0.048)	-0.145** (0.071)
year 2009	-0.336*** (0.073)	-0.357*** (0.041)	-0.558*** (0.066)
year 2011	0.388*** (0.073)	0.256*** (0.044)	0.021 (0.066)
Constant	0.536*** (0.175)	1.133*** (0.143)	1.772*** (0.196)
Observations	3,576	3,576	3,576

Note: dependent variable log difference of expenditure and income. Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Regression Results for Migrant Households with Remittances

VARIABLES	(1)	(2)	(3)	(4)
	Pooled	Pooled controls	FE No time effects	FE Time effects
Current Migrant, remittance	-0.692*** (0.051)	-0.849*** (0.053)	-0.698*** (0.084)	-0.830*** (0.079)
Return Migrant	-0.218*** (0.057)	-0.242*** (0.056)	-0.317*** (0.083)	-0.236*** (0.078)
Migrant Family, Remittance	-0.958*** (0.092)	-1.005*** (0.088)	-1.139*** (0.140)	-1.106*** (0.132)
Age		0.002 (0.002)	0.012*** (0.004)	0.005 (0.004)
Gender		0.024 (0.066)	0.062 (0.116)	-0.138 (0.115)
Married		0.038 (0.070)	0.013 (0.128)	-0.069 (0.121)
Ethnicity		-0.155*** (0.042)	-0.212* (0.125)	-0.072 (0.126)
Number of children 0-14 in a hh		0.062*** (0.011)	0.015 (0.024)	0.023 (0.023)
Number of people (>65) in hh		0.097** (0.046)	0.131 (0.098)	0.132 (0.094)
Complete Secondary Education		0.030 (0.059)	0.105 (0.086)	0.003 (0.084)
Above Secondary Education		0.007 (0.059)	0.104 (0.093)	0.012 (0.090)
Urban		-0.285*** (0.041)		
year 2009		-0.427*** (0.047)		-0.454*** (0.048)
year 2011		0.255*** (0.046)		0.243*** (0.048)
Constant	1.382*** (0.024)	1.259*** (0.155)	0.665** (0.289)	1.236*** (0.283)
Observations	3,655	3,576	3,576	3,576
R-squared	0.059	0.151	0.055	0.144

Note: dependent variable log difference of expenditure and income.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1