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Dennis Görlich, Toman Omar Mahmoud,
Christoph Trebesch

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Kiel Institute for the World Economy, Düsternbrooker Weg 120, 24105 Kiel, Germany

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Explaining Labour Market Inactivity in Migrant-Sending Families: Housework, Hammock, or Higher Education*

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This article presents a new perspective on the impact of migration and remittances on labour market participation and time allocation in migrant-sending families. Departing from the common finding that labour market participation is lower in migrant households, we investigate whether the reasons for inactivity, i.e. leisure consumption, home production and higher education are affected by migration. Based on household survey data from Moldova, our results challenge the assertion that those who stay behind consume more leisure. Instead, living in a migrant household implies higher probabilities of intra-household labour substitution and a substantially higher likelihood of university enrolment.

Keywords: Migration, Remittances, Labour Supply, Time Allocation, Moldova

JEL classification: F22, J22, O15, C35

Dennis Görlich
Kiel Institute for the World Economy
Duesternbrooker Weg 120
24105 Kiel, Germany
Telephone: +49-431-8814-325
Fax: +49-431-8814-502
E-mail: dennis.goerlich@ifw-kiel.de

Toman Omar Mahmoud
Kiel Institute for the World Economy
Duesternbrooker Weg 120
24105 Kiel, Germany
Telephone: +49-431-8814-471
Fax: +49-431-8814-502
E-mail: toman.mahmoud@ifw-kiel.de

Christoph Trebesch
Free University of Berlin
Binger Str. 40
14197 Berlin, Germany
Telephone: +49-30-83858511
E-mail: trebesch@zedat.fu-berlin.de

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1. Introduction

Many countries have witnessed large-scale emigration over the past decades. In parallel, remittances have increased manifold and have become a main component of capital flows to developing economies (World Bank, 2005). A growing body of research shows that migration and remittances can have strong developmental impacts on migrant-sending communities.[1] Amongst others, the departure of migrants and the subsequent receipt of remittances have been found to influence household poverty levels, child health, and even entrepreneurship (see Adams, 2005; Hildebrandt and McKenzie, 2005; Woodruff and Zenteno, 2007).

One field of particular concern are the labour market effects of migration and remittances. Many researchers have analysed how the departure of a household member influences the labour market behaviour of those who stay behind. Most of them find that individuals in migrant households are characterised by lower labour supply, i.e. they work fewer hours and the probability of participation in the formal labour market is lower.[2] In this context, some studies have strongly underlined the potential disincentive effects of remittances and moral hazard problems (e.g. Fullenkamp et al., 2005).

The intuition for the disincentive effect is that individuals who receive regular transfers from abroad will show less work effort and increase their consumption of leisure, e.g. by leaving the labour market (cf. Rodriguez and Tiongson, 2001). Supposedly, the wealth from remittances makes the remaining household members "lazy" (Azam and Gubert, 2006, p. 426), so that "[they] simply stop working and wait from month to month for the overseas remittance" (Kapur, 2005, p. 152). If such an effect were commonplace, it would obviously have serious implications for development. In the worst case, emigration and remittances could lead to a culture of dependency in source communities, along with a reduction of productive activities, labour shortages and other adverse economic effects (Kapur, 2005).

This paper challenges the above interpretation. With a view to the rich literature on intrahousehold allocation of time and labour (Juster and Stafford, 1991; Chiappori, 1997) we argue that the lower probability of labour market participation in migrant households is not

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1 For an overview on the quickly growing literature on the effects of migration and remittances on source country communities see Katseli et al. (2006) or López-Córdova and Olmedo (2006).

2 E.g. Funkhouser (1992), Rodriguez and Tiongson (2001), Acosta (2006), Hanson (2005), Amuedo-Dorantes and Pozo (2006) and Kim (2007).

necessarily due to leisure consumption. In fact, observed inactivity can have its origin in a variety of reasons apart from leisure consumption. Here, we focus on two additional reasons, namely housework and higher education, which might both be strongly affected by migration and remittances. Consider housework first. The departure of a migrant implies that two helping hands might be missing for household duties or child care. Accordingly, individuals in migrant-sending households may choose to provide less labour on the market because it is more rewarding for them to engage in home production. Besides that, it is well possible that younger adults in migrant families are more likely to engage in further education, be it due to the flow of remittances that relieve credit constraints or due to additional incentives for education. This would then explain why they are less likely to participate in the labour market.

In the first step of our analysis, we follow the common approach and test whether having a migrant abroad affects a household member's probability of participating in the labour market. Based on a household survey dataset from Moldova, we find clear evidence for the consensus result: persons living in migrant households indeed appear less likely to be active on the labour market, i.e. outside their households.

The main aim of this article, however, is to examine the reasons of non-participation. In a second step, we therefore consider the subgroup of inactive individuals only and investigate three potential effects of migration and remittances. More precisely, we examine whether living in a migrant household affects (i) an individual's attitude of not wanting or needing to work (*disincentive effect*), (ii) the likelihood of engaging in home production (*labour substitution effect*), and (iii) the decision to engage in higher education (*education effect*). This approach differs from the existing migration literature, which has not accounted for the actual reasons of inactivity.

Overall, we find only weak evidence for disincentive effects. However, our results indicate that persons in migrant households are more likely to be inactive due to home production activities. This might be due to intra-household labour substitution between the migrant working abroad and the inactive members at home. Likewise, we find that migration is an important predictor of education-driven inactivity. Young adults in migrant households are much more likely to go to university, which explains their inactivity on the labour market. In sum, we believe that our results provide some interesting insights on the effects of non-labour

income and on the allocation of labour in migrant-sending families.

The remainder of this article is structured as follows. In section 2 we discuss the theoretical background of our analysis and review the related literature. Section 3 presents the data, the variables used and some stylised facts on Moldova. Section 4 discusses our empirical approach and how we tackle potential problems of self-selection and reverse causality. In section 5, we then provide our empirical results, which will be checked for robustness and further examined in section 6. Section 7 concludes.

2. Theoretical Considerations and Related Literature

This section first reviews the general literature on the labour market impact of emigration and remittances. It then sketches theoretical considerations behind the disincentive, labour substitution and education effect of migration and remittances and reviews the empirical literature related to each of these three effects.[3]

Funkhouser (1992) is one of the first to examine the labour supply effects of migration and remittances. Using simple probit regressions, he finds that the receipt of remittances is a negative determinant of female labour participation in Nicaragua. Using the same econometric method, Rodriguez and Tiongson (2001) analyse the labour market decision of migrant relatives in Manila. The authors find that having a migrant in the household strongly reduces women's probability of working.

More recent research accounts for selection and endogeneity problems, which are potentially severe in this type of analysis. Using an instrumental variable strategy, Acosta (2006) comes to similar results as Funkhouser, namely that remittance-receiving women in El Salvador tend to reduce their labour supply, while men do not. Hanson (2005) employs parametric and non-parametric methods to Mexican household data. His results show that women born in high-migration states tended to reduce hours worked over the 1990s and had a significantly lower probability of participating in the labour market as compared to their counterparts in low-migration states. In an interesting article, Amuedo-Dorantes and Pozo (2006) analyse the relationship between remittances and labour supply for different types of work. Using Mexican data from 2002, they show that remittances appear to negatively affect female work

[3] Note that we refer to both the migration literature and the broader literature on the allocation of time and labour in households, which goes back to seminal work such as Becker (1981).

effort only in rural areas and in the informal sector. Additionally, their results indicate that remittance-receiving men do not reduce labour supply, but tend to shift into informal employment.[4] Recent years have brought about further studies on the effects of migration and remittances on labour supply (see e.g. Airola, 2005, and Kim, 2007). However, to the best of our knowledge, there is no article that has looked at the actual reasons for the observed inactivity in migrant households. Taking into account the non-separability of migration and remittances (cf. McKenzie & Sasin, 2007), we consider three potential explanations of labour market inactivity.

(i) The disincentive effect

The theoretical foundation for the disincentive effect follows directly from the neoclassical theory of labour supply. Under the usual assumption that leisure is a normal good, non-labour income raises the reservation wage of a potential worker. If the prevailing market wage is less than the reservation wage, the household member is inactive on the labour market. In our context, this would mean that the receipt of remittances from the emigrated household member is a source of non-labour income and thus increases the reservation wage of the remaining household members. Thus, assuming identical preferences and the same wage offer to similar persons in migrant and non-migrant household types, the disincentive effect suggests that persons in remittance-receiving households are less likely to participate in the labour market.

Generally, there is extensive literature on the effects of non-labour income (see e.g. Danziger et al., 1981). For the developing country case, Rosenzweig (1980) and Schultz (1990) show that unearned income does have a negative effect on labour supply. Bertrand et al. (2003) investigate the impact of a pension scheme in South Africa on those household members living with a pensioner. They find that other adult family members reduce the labour supply in response to large pension transfers. Joulfaian and Wilhelm (1994) find that inheritances do not lead to large reductions in the labour supply of men and married women, while Imbens et al. (2001) find that large lottery prizes can have a negative impact on labour supply.

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4 Amuedo-Dorantes and Pozo (2006) underline a further impact of emigration on households, namely large, migration-related expenses which can lead to an immediate decrease in household income. This negative income shock may then lead to increased work effort in the labour market and run against the disincentive effect.

In studies on the labour supply in migrant-sending households, authors such as Rodriguez and Tiongson (2001) or Acosta (2006) suggest that lower labour supply in migrant households can be attributed to increased leisure consumption. Similarly, Fullenkamp et al. (2005) point to disincentive effects on work labour effort and moral hazard problems as a likely explanation for finding aggregate remittances flows to be negatively correlated with GDP growth.[5]

(ii) The labour substitution effect

The labour substitution effect can be derived from a labour supply model with household production, which is based on the neoclassical model of labour supply, but allows for the production and consumption of non-market household goods (e.g. Cahuc and Zylberberg, 2004).[6] In such a model, it is possible that the absence of the migrant raises the marginal productivity of household work for those who stay behind. The event of migration leads to a reallocation of wage labour to household labour. Accordingly, persons in migrant households might allocate more time to household production than their counterparts in non-migrant households.

In the general literature, effects of intra-household specialisation are a standard finding (Browning and Chiappori, 1998; Browning et al., 1994 or Lundberg and Pollak, 1996). Yet, we are not aware of studies that explicitly estimate the effect of migration and remittances on intra-household labour substitution although some authors in the field have touched upon the issue. Acosta (2006, p. 37) underlines that "a fall in labour supply in recipient families should not necessarily be viewed as a negative side effect of remittances in a development perspective." In fact, he states that it "could also be associated to higher rates of parental and home production activities." Also Hanson (2005) discusses the possibility of increased intra-household specialisation of labour in migrant households. Here, we aim to provide more specific evidence on these hypotheses.

(iii) The education effect

Recent years have brought about a series of theoretical models on the education effect of migration and remittances (e.g. Mountford, 1997; Stark et al., 1997; Stark and Wang, 2002;

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5 Azam and Gubert (2005) and Rozelle et al. (1999) take agricultural yields as dependent variable to identify potential disincentive effects of remittances.

6 Juster and Stafford (1991) or Chiappori (1997) underline that it is crucial to distinguish between time used for home production and leisure time.

McKenzie and Rapoport, 2006). This literature discusses two main theoretical arguments of how migration and remittances affect educational investments in migrant-sending families. The first is that remittances from the migrant can alleviate credit constraints, enabling receiving households to send their children to school or to university. The second, increasingly discussed, argument is that migration provides incentives for additional education, a phenomenon stressed by the "brain gain" literature. Proponents of the brain gain hypothesis claim that the prospect of migrating in the future can motivate individuals to invest in their human capital. The main reason is that labour markets in destination countries tend to offer higher returns to education than source country labour markets.[7] Given the direct access to a family migration network, the incentives for educational investments should then be stronger in migrant households as compared to their non-migrant counterparts.

However, empirical studies on that issue show rather mixed results.[8] Hanson and Woodruff (2003), Cox Edwards and Ureta (2003), Mansuri (2006) and Yang (forthcoming) provide evidence for a positive effect of migration and remittances on child schooling using data from Mexico, El Salvador, Pakistan and the Philippines respectively. Contrarily, Acosta's (2006) study on El Salvador concludes that remittance recipients do not seem to invest more in children's human capital than non-recipients. For Mexico, McKenzie and Rapoport (2006) and McKenzie (2005) provide some evidence that migration might even discourage educational attainment. In line with Boucher et al. (2005), they argue that most Mexican migrants in the U.S. tend to work in low skilled jobs, so that young Mexicans have little incentives to invest in higher education. Given the low-skilled employment abroad, returns to education are ultimately higher in Mexico – an assumption which is confirmed by the empirical results of Chiquiar and Hanson (2005).

Taken together, the disincentive, labour substitution, and education effects would then define the optimal time allocation strategy. An individual would supply labour up to the point where the marginal rate of substitution between consumption and leisure is not only equal to the wage rate, but also to the marginal productivity of home production, as well as to the net marginal return of investing in further education.

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7 Ultimately, the incentive driven formation of human capital might even outweigh the immediate loss of human capital through emigration, leading to an overall gain of human capital accumulation.

8 Our focus in this short overview is on micro-level studies. Note, however, that there is also some cross-country evidence, such as the article by Beine et al. (2001).

3. Data, Variable Construction, and Stylised Facts

Data

Our analysis is based on the Moldovan Labour Force Survey (LFS) which is conducted on a quarterly basis by the National Bureau of Statistics of the Republic of Moldova. The LFS was introduced in 1998 and contains rich information on every individual in a household, including the information on whether a household member has been working abroad in the last four weeks. It is nationally representative and with about 6,000 households and 17,000 individuals interviewed in each quarter the largest household survey in Moldova.

Moldova is a small, landlocked and densely populated country with large parts of the population living in rural and small town communities. Having witnessed a sharp economic decline after independence in 1991, Moldova's population remains the poorest in Europe. The economy is still predominantly based on agriculture and related industries and has not seen a promising structural change over the last decade.

The LFS documents Moldova's drastic increase in migrant numbers in recent years. The regional economic crisis in 1998 is generally seen as the main trigger for Moldova's mass emigration. In 1999, the share of migrants among the working age population (defined as the 18 to 64 years old), was a mere five per cent. Since then, this figure has been rising steadily, reaching 21 per cent in 2005. At the household level, this means that 28 per cent of all households had a migrant abroad in 2005. This figure is astonishing for a region that, before the Soviet breakdown, was a net importer of labour (OECD, 2002).

Cuc et al. (2005) and Görlich and Trebesch (forthcoming) show that the principal determinants of Moldova's massive emigration flows are access to migrant networks as well as poverty, which increased harshly after independence. Parallel to the large emigration outflows, remittances have considerably increased in recent years. According to World Bank estimates, formal and informal remittance flows have surpassed a share of 27 per cent of GDP in 2004 (Mansoor and Quillin, 2007).

In line with other CIS migrant-sending countries such as Tajikistan or the Kyrgyz Republic, the typical Moldovan migrant is male (69 per cent in 2005), relatively young (average age of 32 years), comes from rural areas (77 per cent) and engages in physical work, often without a

legal status and under dismal conditions. There is generally only one migrant per household (73 per cent) so that, in most cases, large parts of the family stay behind (compare table A1 in the appendix and Mansoor and Quillin, 2007). Similar to other former Soviet Republics, Moldova features relatively high rates of secondary and tertiary education. Given that most Moldovan pupils complete twelve years of schooling, the decision on additional educational investments becomes interesting only at the age of 18.[9] Therefore, it makes sense to investigate the education effect of migration for young adults in the age group of potential university students from 18 to 25 years.

For our empirical analysis, we use LFS data of 2005. We pool quarterly data for this year to increase the number of observations and to avoid that seasonal effects distort our results.[10] Generally, our sample includes all individuals in working age with the exception of pensioners, individuals pursuing military service and those who are currently unemployed, but reported to have found a job and start working soon. We also exclude migrants because our analysis focuses on the household members that remain in Moldova. Moreover, we base our analysis only on individuals living in rural households, because, as stated above, migration is a predominantly rural phenomenon. Besides, we find the impact of migration on those who stay behind to be more pronounced in rural settings. This leaves us with a final sample of 21,150 individuals.

Construction of dependent variables

The binary variable indicating labour market inactivity is simply the labour market status variable from the LFS, i.e. the person is neither employed, nor self-employed or unemployed. Note that pure subsistence farmers are also counted as inactive, but farmers who sell at least parts of their products are not counted as inactive.

To proxy the disincentive, labour substitution and education effect, we rely on a particular question from the LFS questionnaire, asking: “What was the main reason you were not looking for a job during the past four weeks?” The question was answered by all inactive individuals. The answer options (only one response was possible) and their percentage

9 According to the LFS dataset used here, 89 per cent of 15 to 17 year old attended school in 2005.

10 There are seasonal fluctuations in migrant numbers as the demand for migrant labour in Russia and other destination countries is higher during summer and autumn.

distribution are listed in table 1. The table also shows which answers we used as proxies for the different effects.

Table 1: Answers to "What was the main reason you were not looking for a job during the past four weeks?" (in per cent)

	Overall	Living in a		Proxy for
		Migrant household	Non-migrant household	
Waiting for re-employment at the most recent job	0.35	0.00	0.56	
Applied for employment and waiting for results	1.42	1.35	1.47	
Do not wish to work	6.48	7.18	6.05	disincentive effect
Education	37.85	42.11	35.26	education effect
Family duties (incl. work on household farm)	19.09	21.19	17.80	labour substitution effect
Disease or disability	7.18	6.12	7.82	
Do not know how and where to look	4.11	4.13	4.11	disincentive effect
Do not consider myself to be qualified	0.67	0.92	0.52	disincentive effect
Believe will not find a job due to my age	1.29	1.64	1.08	disincentive effect
Looked for a job before but failed to find one	21.13	15.22	24.72	
Other	0.32	0.00	0.52	

To proxy the disincentive effect, we construct a binary variable *"not willing to work"*. We assume that persons who report that they do not wish to work are in fact not actively searching for a job and are therefore satisfied with their current inactivity status. In line with our theoretical considerations, we assume that these persons' reservation wages are higher than the wages available to them, so that they opt for leisure consumption. Moreover, we argue that individuals who report that they do not know how and where to look for a job, who do not consider themselves as qualified, and who believe to be too old for finding

employment are not searching actively either, and also assume that their reservation wage is higher than the market wage.[11]

To capture the labour substitution effect, we construct the binary variable *"housework"*. We assign this dummy to persons who reported to be inactive due to family duties or due to work on the household farm. In line with our theoretical considerations, we assume that these persons are more productive in housework than in other activities.

Finally, as a proxy for the education effect, we construct the binary variable *"education"* and assign it to persons who are inactive due to tertiary education. Overall, we believe that this classification is useful to capture the various effects of migration and remittances in migrant households. The proxies account for almost 70 per cent of the reasons for inactivity.

Descriptive statistics and stylised facts

Table A2 in the appendix provides the summary statistics for our sample; for all households and for members of migrant and non-migrant households separately. At the individual level, the explanatory variables used in this analysis are age, education, gender, marital status and position in the household. Moreover, we control for household composition by including household size, the number of skilled adults, and the fractions of young children (between age 0 and 6) and older household members (older than 65) at the household level. We also include some variables at the community level to account for regional disparities in development. These variables include average plot size, the level of industrial production, the number of physicians per 10,000 inhabitants, and the number of schools and pre-schools. The community level variables are all taken from the 2005 Statistical Yearbook of Moldova.

Unfortunately, the LFS neither provides details on income and expenditure, nor on wealth levels. However, we believe that the income-generating possibilities of the household and an individual's welfare level can be adequately proxied by additional explanatory variables such as the number of skilled adults in the households and a dummy indicating whether the family is engaged in farmwork.

As table 2A shows, about 30 per cent of the individuals in our sample live in households with a migrant currently abroad. A comparison of characteristics of migrant and non-migrant

[11] Note however, that we make robustness checks of our analysis where we exclude the latter groups of persons in the disincentive effect and explicitly consider "discouraged" workers.

households shows that labour market inactivity is more common in migrant than in non-migrant families (25 vs. 18 per cent). The educational level of individuals is very similar across household types. Looking at the household composition, it shows that migrant households (excluding the migrant) are smaller than non-migrant households on average. Moreover, the average number of skilled adults in a migrant household (excluding the migrant) is slightly lower than in non-migrant households, suggesting a lower potential to generate income in migrant households. The averages of the community-level indicators do not differ notably.

4. Econometric Approach

Our econometric approach involves two steps. In the first step, we use the entire sample of individuals to test whether those living in migrant households are more likely to be inactive. In the second and main step of the analysis, we then take the subgroup of inactive individuals and test for the disincentive, labour substitution, and education effects.

The explanatory variable of interest in our study is a binary indicator for living in a household with a member currently working abroad (*migranthh*). We prefer using *migranthh* to a variable for remittances because we intend to capture the overall impact of migration on remaining household members, i.e. not only the monetary, but also the physical impact of a person abroad (cf. McKenzie and Sasin, 2007) and potential incentive effects of migration on education.[12]

In the first step we use a bivariate probit model to estimate the impact of having a migrant on individual labour force participation. The simple application of probit or logit models in the given context is challenged by some econometric issues. First, there is the possibility of self-selection. Unobserved characteristics such as wealth, social skills or motivation to work might not only have an effect on the likelihood of being in a migrant household but also influence the individual's decision to be inactive. Second, *migranthh* is a potentially endogenous variable. A household member might have migrated and send remittances just because another member is inactive. To account for these issues, we follow the recent empirical

[12] McKenzie and Sasin state that "information on the amount of remittances is helpful but not essential." (2007, p. 4). Our data does not contain information on remittances. However, remittances and migration are very closely connected in Moldova. Lücke et al. (2007) note that more than 80 per cent of Moldovan migrants remit, a figure based on a large, representative household survey on migration in the country.

literature (e.g. Barham and Boucher, 1998, or McKenzie and Rapoport, 2006) and estimate a bivariate probit model of the following form:

$$y_i^{inactivity} = \alpha_1 + \beta_1 migranthh_i + x_i^{'}\gamma_1 + \varepsilon_{1i} \qquad (1)$$

$$migranthh_i^{*} = \alpha_2 + x_i^{'}\gamma_2 + \vartheta z_i + \varepsilon_{2i} \qquad (2)$$

$$\text{with } y_i^{inactivity} = \begin{cases} 1 \text{ if } y_i^{inactivity*} > 0 \\ 0 \text{ if } y_i^{inactivity*} \leq 0 \end{cases} \qquad (3)$$

where $y_i^{inactivity*}$ is the unobserved latent variable and $y_i^{inactivity}$ the observed binary outcome taking the value of one if individual *i* is inactive in the labour market and zero otherwise. Higher inactivity in migrant households would imply a significantly positive sign of the coefficient β_1. The vector x_i contains other explanatory variables which control for observable heterogeneity at the individual and household level.

The variable *z* denotes the instrument used to identify migrant households. Note that the correlation between the inactivity decision and living in a migrant household is given by $\rho = Cov(\varepsilon_{1i}, \varepsilon_{2i})$, where the disturbances ε_{1i} and ε_{2i} are assumed to be bivariate normally distributed. Endogeneity of *migranthh* in the model can be tested straightforwardly by $H_0 = \rho = 0$. If the value of ρ is not statistically different from 0, the estimation of (1) could be done using a standard probit model.

The second and main step of our estimations requires a different estimation setup. As stated, we aim to explain whether living in a migrant household is related to the disincentive effect, the labour substitution effect, or the education effect. As explained above, we capture the three effects by the dependent binary variables *not willing to work (N)*, *housework (H)* and *education (E)* respectively. These three variables, however, are substitutes, i.e. conflicting alternatives of why an individual is inactive. In other words, the decisions to consume leisure, to engage in home production or to attend university are not independent of each other so that a simultaneous estimation approach is needed. As before, we control for self-selection and the potential endogeneity of *migranthh* with an instrumental variable strategy.

The resulting model is a multivariate probit model with four equations:

$$N_i^* = \alpha_1 + \beta_1 migranthh_i + x_i^{'}\delta_N + \nu_{Ni} \quad (4)$$

$$H_i^* = \alpha_2 + \beta_2 migranthh_i + x_i^{'}\delta_H + \nu_{Hi} \quad (5)$$

$$E_i^* = \alpha_3 + \beta_3 migranthh_i + x_i^{'}\delta_U + \nu_{Ui} \quad (6)$$

$$migranthh_i^* = \alpha_4 + x_i^{'}\delta_M + \vartheta z_i + \nu_{Mi} \ , \quad (7)$$

where *N*, H*, E** and *migranthh** are again unobserved latent variables. The advantage of a multivariate probit approach is that it allows the choice among alternatives to have arbitrary correlations. The pair-wise correlation of the error terms does not necessarily equal zero. Rather, the vector of error terms is assumed to follow the four-variate normal distribution with the correlation matrix Ω. In analogy to the bivariate probit case above, the estimation of the extra-diagonal elements of Ω, i.e. the cross-equation correlation coefficients, will allow us to control for unobserved heterogeneity and correct for potential endogeneity biases (for a similar setup see e.g. Cappellari, 2004). An additional advantage of the multivariate probit framework is the possibility to include different regressors in different equations. We make use of this by including household head's education in (6). Unlike the model in (1) and (2), however, multivariate probit models with more than two equations cannot be estimated using maximum likelihood, unless one uses simulation techniques (McFadden 1989). Here, we resort to the maximum simulated likelihood estimation routine suggested by Cappellari and Jenkins (2003; 2006). As a robustness check to the multivariate probit results we also perform standard multinomial logit estimations.

Given the potential biases outlined above, the instrumentation strategy is crucial for our analysis. We instrument the variable *migranthh* with regional migration networks. This is in line with a number of recent, closely related articles that also employ regional migration networks as instruments e.g. Hanson and Woodruff (2003), Mansuri (2006), McKenzie and Rapoport (2006) or Woodruff and Zenteno (2007). The intuition behind this instrumentation strategy is that regional migrant networks are highly correlated with individual or household migration choices. This also seems to be the case for Moldova, where regional migrant networks are among the principal determinants of migration at the household level (see Görlich and Trebesch, forthcoming). Access to migrant networks can significantly lower the costs and risks of migrating and potentially increase the economic returns of migration (Munshi, 2003; Winters et al., 2001). A main reason is that migrant networks are information networks. It is probably easier to attain information on travel modes, possible hazards or work

opportunities abroad in a community that has already sent out large numbers of migrants (Boyd, 1989).

While being correlated with individual migration probabilities, past regional migration networks are expected to be exogenous to current individual labour market outcomes or individual education choices. An individual's decision of going to university or engaging in home production should not be closely affected by the number of migrants in the region. To get a network measure that is as reliable as possible, we use data from the 2004 census of Moldova. We then calculate the share of migrant households per region for 33 different regions in Moldova. Such a census-based measure of migration networks is less likely to be correlated with unobserved household-level variables as compared to network measures constructed from variables in the same dataset.

It should be noted that the regional migrant network, similar to every regional level variable, does not show enough variation at the household level. A further potential problem with the instrument is that a regional network variable might be correlated with unobservables at the regional level that may affect average labour market or education outcomes. To deal with these issues, we interact the network variable with household-specific variables to generate additional variation.[13] We opted to interact the regional network variable with the share of male adults in the household, because migration in rural areas is a predominantly male phenomenon in Moldova. We also chose the share of married adults in the household.[14] To check the validity of our instruments, we test for overidentifying restrictions. We cannot reject the null hypothesis of exogenous instruments at usual significance levels. In addition, the instruments turn out to be highly significant (F-statistics are always greater than 10), hence not indicating a weak instrument problem.[15]

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[13] A similar approach is chosen by Amuedo-Dorantes and Pozo (2006), Hanson and Woodruff (2003) or Mansuri (2006).

[14] In additional regressions (not reported), both the share of married adults and the share of male adults are important determinants of migration.

[15] We also tried out other instruments. Amongst other, we checked the applicability of the following instruments: (i) the number of Western Union offices in the region (see Amuedo-Dorantes and Pozo (2006) for a similar instrumentation approach), (ii) census data on the share of people in the region with a second passport, because Romanian or Bulgarian citizenship is widespread in Moldova and a second passport can ease emigration significantly (see e.g. McKenzie, 2005) and (iii) regional migration rates of migrants that left before 1999 (as provided by the 2004 census). However, the instrumental variable tests reject the use of these instruments. Hence, regional migration networks seem to be the most appropriate instrument for migration in the Moldovan context.

As also noted by Acosta (2006), the labour market impact of remittances and migration is likely to differ with age. In the next section, we will therefore present our results for three age groups separately. The first, capturing the 18 to 25 years old, is the group for which all three effects, including the education effect are potentially relevant.[16] In contrast, individuals in the second (26-50 years) and third (51-64 years) age group, are very unlikely to engage in higher education. Thus, for the older age groups, the multivariate probit model does not consider the education effect (6).

5. Results

As mentioned, we first estimate whether living in a migrant household is associated with a lower probability of labour market participation. Table 2 shows the marginal effects of *migranthh*. The complete estimation output is displayed in table A-3 in the appendix. Our results indeed show that living in a migrant household is associated with a higher probability of being inactive and therefore reinforce the findings of previous authors.[17] For the overall sample, living in a migrant household increases the probability of non-participation by 3 per cent, which is a low but statistically significant effect. A separation by age, however, reveals differing results: In the sample of young (potential) workers, the effect is much stronger: the likelihood of non-participation is 9 per cent higher for members of migrant households. For the middle age group of 26 to 50 year-olds, the effect is only 1.4 per cent, but still highly significant. In the sample of 51 to 64 year-olds, living in a migrant household is unrelated to labour market inactivity.

Note that the results described were those of the bivariate probit estimations, which deals with endogeneity and selection issues. For comparison, we also include results of an ordinary probit estimation. The results are of different magnitude, but the ordering and direction are identical. However, the correlation coefficient between the inactivity decision and living in a migrant household ρ turns out to be significant. Hence, the bivariate probit model seems to be more appropriate.

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16 Only 20 students in our sample are older than 25 years.

17 The marginal effects are similar to those estimated by Acosta (2006), although he only looks at the male and female sample separately, and reports the marginal effects of a variable indicating the receipt of remittances. Direct comparison to other studies is difficult because they often use hours worked as dependent variable (e.g. Amuedo-Dorantes and Pozo, 2006).

Table 2: Marginal effect of *migranthh* on the probability of being inactive

	Sample			
Technique	A. Overall	B. 18-25 yrs	C. 26-50 yrs	D. 51-64 yrs
Biprobit	0.028***	0.089***	0.014***	0.002
Probit	0.048***	0.069***	0.025***	-0.002

Note: Marginal effects are calculated at sample means.

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level.

Having established that the likelihood of labour market inactivity is higher for members of migrant households, we turn to the relation between migration and the three effects discussed above. Again, the correlation coefficients support the use of the multivariate probit model. Table 3 shows the marginal effects of the variable *migranthh* on the proxies for the three effects; they indicate the significance, direction and magnitude of the disincentive, labour substitution, and education effect. Full estimation outputs are provided in tables A4-A6 in the appendix. On the whole, the coefficients of our control variables have the expected signs and significance levels. Note that all our findings for the following multivariate probit models are robust to using multinomial logit models.

The disincentive effect is present only for the oldest age group (51-64 year-olds). For the youngest individuals (18-25 year-olds), the disincentive effect is statistically insignificant, while for the middle age group (26-50 year-olds) it is weakly significant, but negative. In other words, young and middle-aged members of migrant households are not more likely than non-migrant households to be inactive due to reasons related to unwillingness to look for employment. The positive, though small disincentive effect for older household members in migrant households appears reasonable, as older people might indeed use additional income from remittances to retire from the labour market.

The labour substitution effect seems to be important for all age groups, albeit in different ways. On the one hand, individuals between 26 and 50 years from migrant households have a 13 per cent higher likelihood of being inactive due to family reasons or household and farm work activities than their counterparts in non-migrant households. This finding suggests that the middle age group in migrant households may be more productive in housework than their counterparts in non-migrant households. This supports the hypothesis that a household

member who emigrated needs to be replaced by another household member, e.g. for child caring or helping out on the household farm.

Table 3: Marginal effect of *migranthh* on proxies for the three effects

	A. 18-25 yrs	B. 26-50 yrs	C. 51-64 yrs
Disincentive effect	0.001	-0.019*	0.036**
Labour substitution effect	-0.078**	0.130***	-0.209***
Education effect	0.200***	–	–

Note: Sample contains inactive individuals only. Marginal effects are calculated at sample means using the Stata command *mvppred* (Cappellari and Jenkins, 2006).

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level.

On the other hand, we find strong negative marginal effects of *migranthh* for both younger and older individuals, i.e. those from a migrant household are less likely to report home production as the main reason for their labour market inactivity. For young individuals, the lower probability to work in the household might be driven by a strong positive education effect (see below), suggesting that the available time is used for visiting university and is consequently not available for home production.

For older household members, a possible reason for the negative effect might be that they use the additional income from remittances to withdraw from home production activities, and consume more leisure instead. Consider for example an individual who had performed home production activities already before a household member migrated. The receipt of remittances could then decrease the willingness to engage in home production and induce an individual to purchase the previously home-produced goods on the market. This would of course mean that these people were already inactive before someone from their household emigrated. This is completely feasible because our data does not allow to determine the labour market status of an individual before migration took place. Note that the first part of our analysis supports our reasoning because we showed that migration is unrelated to inactivity for the oldest age group (see table 2). Nevertheless, our analysis suggests that behaviour "within inactivity" differs between the older individuals in migrant and non-migrant households.

The education effect was only estimated for the sample of young persons, aged between 18 and 25 years. As table 3 shows, the education effect is statistically significant and rather strong (20 per cent). As discussed above, this positive linkage between migration and

education might be explained by the potential of remittances to relieve credit constraints or by additional, migration-related incentives to engage in education.

Note that one might argue that we pick up a wealth effect because we can only imperfectly control for household wealth. McKenzie and Rapoport (2007) show that migration can be a selective process, with members from richer households being more likely to migrate, particularly in the absence of migration networks and when migration costs are high. If that were true, the coefficients for *migranthh* might simply be a wealth effect. Yet, the results by Görlich and Trebesch (forthcoming) suggest that migration is not selective in the Moldovan case. In fact, it seems to be a coping strategy for the poor, with extensive migrant networks and low migration costs.[18] This view is also supported by the results of a recent household survey in Moldova which asked retrospective questions on socio-economic status and asset ownership. Lücke et al. (2007) illustrate that today's migrant and non-migrant households in Moldova were surprisingly similar in terms of living conditions and ownerships of different assets in 1998, i.e. shortly before mass emigration took off in Moldova. In addition, they show that migrant households have experienced much faster asset accumulation and poverty reduction than their non-migrant counterparts. Thus, it rather seems that wealth is an outcome of migration and not vice versa.

Moreover, one could argue that the high number of seasonal migrants in Moldova might bias our results because a seasonal migrant might not be counted as such when he is at home during the time when the LFS interviews took place. However, we do not regard this as problematic as it would lead to a downward bias, i.e. an underestimation of the effects of migration. In other words, if households with seasonal migrants currently at home are mistakenly classified as non-migrant households, the actual effects of migration show up in the group of non-migrant households, and therefore make the difference between migrant and non-migrant households less significant.

[18] The costs of migration to Russia, the main destination country of Moldovan migrants, are as low as US$100. As a result of migrant networks at home and at the destinations, more than 70 per cent of all migrants already have a job upon arrival at the destination country.

6. Robustness Checks

This section provides some additional analysis to check the robustness of the results established above. We proceed by discussing the main points that could challenge our findings.

First, one might argue that a migrant member in the household is just a proxy for having a working member in the family. Recall that our sample only includes inactive individuals in rural households. In such a setting, a migrant and a full-time working member might have a similar influence on the labour supply decision of the remaining household members. Both would be cash earners for the household and not able to heavily engage in home production.[19] To verify that our findings are indeed related to living in a migrant household, we additionally control for the number of salaried or self-employed family members in the regression framework. Table 4 shows that our results remain robust when including this additional variable.[20] Apparently, the permanent absence of a migrant working abroad, causes stronger effects than a working member who remains at home.

Table 4: Robustness check I: controlling for the number of working household members. Marginal effect of *migranthh* on proxies for the three effects

	A. 18-25 yrs	B. 26-50 yrs	C. 51-64 yrs
Disincentive effect	0.003	-0.018	0.036**
Labour substitution effect	-0.063*	0.121**	-0.211***
Education effect	0.176**	–	–

Note: Sample contains inactive individuals only. Marginal effects are calculated at sample means using the Stata command *mvppred* (Cappellari and Jenkins, 2006).

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level.

Another issue of concern might be the way in which we measure the disincentive effect. So far, we have proxied the disincentive effect by using the answer categories “do not wish to work”, “do not know how and where to look for a job”, “do not consider myself to be qualified”, and “believe I will not find a job due to my age” (refer to table 1). We have implicitly assumed that our choice is justified because we control for the educational

[19] On average, full-time workers worked for more than 40 hours per week in our sample.

[20] One should bear in mind, however, that we do not control for potential endogeneity of the number of working household members.

qualification and age of inactive individuals. Yet, it may well be that our choice is too broad and should only contain the answer categories that are most strongly associated with the disincentive effect. We therefore modify our definition to contain only individuals that stated "do not wish to work" as the main cause of inactivity. Table 5 demonstrates that our results are not strongly affected by this robustness check. Only in the oldest age group results change, as we can no longer observe the disincentive effect. It appears that labour market inactivity among the elderly in migrant households is rather associated with the reasons which now were excluded.

Table 5: Robustness check II: changing the definition of the disincentive effect. Marginal effect of *migranthh* on proxies for the three effects

	A. 18-25 yrs	B. 26-50 yrs	C. 51-64 yrs
Disincentive effect	0.002	-0.013	-0.001
Labour substitution effect	-0.074*	0.139***	-0.216**
Education effect	0.182**	–	–

Note: Sample contains inactive individuals only. Marginal effects are calculated at sample means using the Stata command *mvppred* (Cappellari and Jenkins, 2006).

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level.

Lastly, we explicitly take into account discouraged workers. A look at the answer categories listed in table 1 suggests that the frequently answered category "looked for a job but failed to find one" may offer additional insights into the disincentive effect. The constant stream of remittances could well reduce the job search efforts of an unemployed or inactive individual in a migrant family. To test for this effect, we add an additional binary dependent variable to our econometric framework, capturing those individuals who gave up looking for a job. The result is shown in table 6. It does not support the view that inactive members of migrant households are more likely to be discouraged workers. On the contrary, it seems that living in a migrant family is significantly and negatively associated with this phenomenon. Possibly, this is due to the different incentive structure in migrant households. In fact, we have argued that members in migrant households face higher returns to home production and educational efforts, making them less likely to be discouraged.

Table 6: Robustness check III: introducing the possibility of discouraged workers. Marginal effect of *migranthh* on proxies for the three effects

	A. 18-25 yrs	B. 26-50 yrs	C. 51-64 yrs
Disincentive effect	-0.006	-0.015	0.016
Discouraged worker	-0.018**	-0.017***	0.061
Labour substitution effect	-0.068**	0.147**	-0.206
Education effect	0.203***	–	–

Note: Sample contains inactive individuals only. Marginal effects are calculated at sample means using the Stata command *mvppred* (Cappellari and Jenkins, 2006).

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level.

7. Conclusion

This article analysed the labour market impact of migration and remittances. Our aim was to better understand the common finding that people in migrant-sending households are characterised by lower labour supply. For this purpose, we used household survey data from Moldova, a country that is heavily affected by emigration.

Altogether, we do not find evidence for disincentive effects of migration and remittances. Living in a migrant household does not seem to be a systematic determinant of leisure-driven inactivity or individual unwillingness to look for a job. However, we do find strong indications that migration increases the probability of being inactive due to participation in higher education and because of home production. The departure of a migrant appears to increase the likelihood of intra-household specialisation, with the migrant working abroad and the remaining household members engaging in childcare, subsistence farming or other household duties.

As to education, our findings provide some positive signs, at least at the individual level. Migrant households in Moldova seem to use their additional resources to invest in the education of their young adults. Once these young adults complete their higher education, they may have higher income-generating possibilities and become less dependent from future remittances flows. A recent World Bank report on the effects of migration in Eastern Europe states that “specialists in Moldova fear that among other negative repercussions, inadequate education (both at school and at home) will have long-term negative implications for human

development in the country" (Mansoor and Quillin, 2007, p. 179). At least with respect to university education and for those between 18 and 25 years, our results contradict this view to a certain extent. Instead, we provide some indication that the boom in university enrolment rates, which could be observed in Moldova in recent years, might partly be explained by the strong increase in migration and remittances flows. Of course, the long-term impact of higher education rates for the country is unclear as we do not know whether the increase in higher education rates due to migration will ultimately lead to a brain gain, or whether those who studied will eventually leave the country. Moreover, it is impossible to judge the quality of the additional education acquired.

We believe that our approach and the evidence provided can be of use to policy-makers and researchers alike. A main conclusion of this study is that one should be careful with premature interpretations of the impact of emigration and remittances on labour supply. The disincentive effect might be less important than sometimes believed. Instead, other effects, in particular intra-household labour substitution and higher education, play an important role, too. However, our results should not be misinterpreted. We do not show that remittances income has no disincentive effects at all. In fact, it could well be that individuals in migrant households remain active on the labour market but work less hours to consume more leisure. Moreover, we cannot observe the remaining member's degree of productivity or motivation in their home production and education activities.

More research is needed to scrutinise our findings and interpretations. In particular, it could be rewarding to conduct a similar analysis using panel data from a migrant-sending country. Hopefully, future surveys will produce a dataset that is large enough to include a representative group of new migrant households to investigate the effects we are interested in.

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Table A1: Characteristics of rural migrants (n=5,048)

age	32.23
male (%)	69.14
secondary education (%)	57.63
higher education (%)	8.82
university education (%)	4.87
married (%)	52.00
household head (%)	14.64
household size	2.59
share of young children (0-6) (%)	7.15
number of skilled adults (18-65)	1.01
share of elderly (>64) (%)	5.20
household farm (%)	34.17
mean regional plot size	2.94
regional intensity of industrial production	3.21
regional density of physicians	15.93
regional density of schools	2.27E-03
regional density of preschools	1.86E-03

Table A2: Characteristics of working age migrant and non-migrant household members (n=18,359)

	migrant hhs	non-migrant hhs	overall
inactive (%)	25.26	18.12	20.29
age	39.91	40.52	40.33
male (%)	37.26	49.59	45.84
secondary education (%)	56.84	55.63	56.00
higher education (%)	9.51	8.63	8.89
university education (%)	4.97	6.14	5.78
married (%)	75.14	71.72	72.76
household head (%)	46.96	42.69	43.99
household size	296.57	350.17	333.90
share of young children (0-6) (%)	6.00	4.79	5.16
number of skilled adults (18-65)	1.37	1.72	1.61
share of elderly (>64) (%)	1.40	3.08	2.57
household farm (%)	38.30	45.37	43.22
mean regional plot size	2.45	1.93	2.09
regional intensity of industrial production	3.05	2.63	2.75
regional density of physicians	15.59	16.19	16.01
regional density of schools	2.26E-03	2.38E-03	2.35E-03
regional density of preschools	1.84E-03	1.91E-03	1.89E-03
migranthh (%)	100.00	0.00	30.37

Table A3: Bivariate probit model of individual inactivity on the labour market

	inactivity			migranthh	
migranthh	0.48	***	migrant network * share of male adults	16425.99	***
	(4.34)			(19.10)	
			migrant network * share of married adults	-13256.14	***
				(-20.62)	
age	-0.14	***		-0.16	***
	(-16.80)			(-20.35)	
age squared	0.001	***		0.002	***
	(14.39)			(17.48)	
male	-0.31	***		-0.65	***
	(-9.81)			(-24.18)	
secondary education	0.05			0.53	***
	(1.28)			(14.59)	
higher education	-0.28	***		0.54	***
	(-4.67)			(10.52)	
university education	-0.53	***		0.49	***
	(-6.63)			(7.66)	
married	-0.30	***		1.19	***
	(-7.60)			(22.71)	
household head	-0.03			0.40	***
	(-0.76)			(13.91)	
household size (excl. migrant)	-0.01			-0.18	***
	(-0.49)			(-10.97)	
share of young children (0-6)	0.17			0.19	
	(1.59)			(1.42)	
number of skilled adults (18-64)	0.06	***		-0.29	***
	(3.07)			(-11.88)	
share of elderly (>64)	-0.15			-1.19	***
	(-1.01)			(-7.41)	
household farm	0.38	***		-0.08	***
	(14.42)			(-2.70)	
mean regional plot size	-0.02	**		0.10	***
	(-2.48)			(8.53)	
regional intensity of industrial production	0.05	***		0.07	***
	(5.98)			(7.19)	
regional density of physicians	-0.04	***		-0.05	***
	(-7.48)			(-9.99)	
regional density of schools	28.69			-275.57	***
	(0.71)			(-6.21)	
regional density of preschools	67.03	*		-52.67	
	(1.76)			(-1.26)	
constant	2.51	***		4.21	***
	(10.34)			(22.81)	
Log pseudolikelihood	-16641.73				
rho	-0.18	***			
	(-2.64)				
Number of obs.	18359				
Wald chi2(39)	5152.91				
Prob > chi2	0.0084				

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level. t-statistics in parentheses.

Table A4: Multivariate probit model of the inactivity reasons of the first age group (18-25)

	not willing to work		housework			inactive student			migranthh	
migranthh	0.02		-0.61	**		0.71	***	migrant network * share of male adults	11564.69	***
	(0.09)		(-2.06)			(2.74)			(3.31)	
								migrant network * share of married adults	4964.58	**
									(2.15)	
age	0.19		0.05			0.01			0.13	
	(0.23)		(0.08)			(0.01)			(0.28)	
age squared	-0.01		0.002			-0.004			-0.01	
	(-0.33)		(0.16)			(-0.33)			(-0.46)	
male	0.22	*	-0.20	**		-0.17	*		-0.41	***
	(1.77)		(-2.00)			(-1.90)			(-4.14)	
secondary education	0.17		-0.16		secondary education (head)	-0.31	***		0.43	***
	(0.99)		(-1.37)			(-3.16)			(4.15)	
higher education	-3.21	***	-0.24		higher education (head)	0.01			0.64	**
	(-14.05)		(-1.06)			(0.04)			(2.54)	
university education	2.97	***	-1.48		university education (head)	0.07			0.38	
	(-11.23)		(-1.17)			(0.48)			(1.12)	
married	0.87	**	2.04	***		-2.43	***		-0.32	
	(2.33)		(8.35)			(-9.09)			(-1.51)	
household head	-0.16		-0.53			0.45	**		0.11	
	(-0.37)		(-1.18)			(2.07)			(0.41)	
household size (excl. migrant)	0.06		-0.03			-0.05			-0.32	***
	(1.02)		(-0.51)			(-1.05)			(-8.16)	
share of young children (0-6)	-0.89		3.19	***		-1.86	***		0.80	
	(-0.83)		(5.47)			(-3.30)			(1.56)	
number of skilled adults (18-64)	-0.18	**	-0.33	***		0.55	***		-0.37	***
	(-2.24)		(-5.14)			(11.10)			(-7.14)	
share of elderly (>64)	-1.98		-0.38			1.22	*		-0.35	
	(-1.60)		(-0.63)			(1.76)			(-0.66)	
household farm	0.05		1.38	***		-0.60	***		0.05	
	(0.40)		(11.68)			(-6.73)			(0.67)	
mean regional plot size	-0.01		-0.01			0.07	*		0.10	***
	(-0.28)		(-0.28)			(1.88)			(3.60)	
regional intensity of industrial production	0.03		-0.004			0.004			0.08	***
	(0.82)		(-0.14)			(0.16)			(3.53)	
regional density of physicians	0.03		-0.05	***		0.01			-0.06	***
	(1.24)		(-2.94)			(0.71)			(-4.39)	
regional density of schools	119.39		-128.11			193.71			-526.63	***
	(0.77)		(-0.97)			(1.53)			(-5.19)	
regional density of preschools	384.02	***	-120.76			-82.60			25.85	
	(2.60)		(-1.03)			(-0.74)			(0.26)	
constant	-4.82		-1.56			1.20			2.07	
	(-0.55)		(-0.25)			(0.22)			(0.44)	
Log pseudolikelihood	-1904.34									
rho	likelihood ratio test rho21=rho31=rho32=rho42=rho43=0: cho2(6)=367.02, Prob>chi2=0.00									
Number of obs.	1796.00									
Wald chi2(39)	3998.41									
Prob > chi2	0.0000									

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level. t-statistics in parentheses.

Table A5: Multivariate probit model of the inactivity reasons of the second age group (26-50)

	not willing to work		housework			migranthh	
migranthh	-0.47	*	0.61	***	migrant network * share of male adults	14058.49	***
	(-1.67)		(2.73)			(4.78)	
					migrant network * share of married adults	-12257.42	***
						(-4.45)	
age	-0.07		-0.02			-0.40	***
	(-0.66)		(-0.22)			(-5.32)	
age squared	0.001		0.00004			0.01	***
	(0.73)		(0.03)			(5.33)	
male	-0.10		-0.58	***		-1.19	***
	(-0.57)		(-4.23)			(-7.16)	
secondary education	0.44	*	-0.12			1.26	***
	(1.83)		(-0.66)			(7.14)	
higher education	0.70	**	-0.26			1.07	***
	(2.20)		(-1.03)			(4.69)	
university education	-1.91		0.64			1.84	***
	(-1.60)		(1.42)			(4.92)	
married	0.12		0.44	***		1.89	***
	(0.62)		(3.06)			(6.04)	
household head	0.26		0.28	**		1.08	***
	(1.53)		(2.01)			(7.42)	
household size (excl. migrant)	-0.08		0.11	**		-0.25	***
	(-1.44)		(2.33)			(-6.05)	
share of young children (0-6)	-1.84	***	2.66	***		0.19	
	(-3.38)		(5.78)			(0.60)	
number of skilled adults (18-64)	-0.27	**	-0.01			-0.67	***
	(-2.30)		(-0.08)			(-5.94)	
share of elderly (>64)	0.29		0.48			-0.11	
	(0.46)		(1.15)			(-0.21)	
household farm	-1.26	***	2.16	***		-0.004	
	(-8.42)		(17.65)			(-0.04)	
mean regional plot size	0.05		0.16	***		0.25	***
	(0.75)		(2.84)			(3.69)	
regional intensity of industrial production	0.03		-0.10	***		0.10	***
	(0.98)		(-4.00)			(3.63)	
regional density of physicians	-0.07	***	-0.05	***		-0.09	***
	(-3.06)		(-2.93)			(-4.55)	
regional density of schools	491.56	***	240.84	**		-287.28	**
	(3.66)		(2.17)			(-2.40)	
regional density of preschools	-709.84	***	-89.41			-166.56	
	(-4.69)		(-0.80)			(-1.48)	
constant	1.59		-0.41			7.68	***
	(0.81)		(-0.25)			(5.11)	
Log pseudolikelihood	-1252.55						
rho	likelihood ratio test rho21=rho31=rho32=0: cho2(3)=72.11, Prob>chi2=0.00						
Number of obs.	1423.00						
Wald chi2(58)	871.58						
Prob > chi2	0.0000						

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level. t-statistics in parentheses.

Table A6: Multivariate probit model of the inactivity reasons of the third age group (51-64)

	not willing to work		housework			migranthh	
migranthh	0.76	**	-0.98	***	migrant network * share of male adults	14403.19	***
	(2.05)		(-3.58)			(3.19)	
					migrant network * share of married adults	-33125.18	***
						(-5.52)	
age	1.06		-0.47			-0.42	
	(0.84)		(-0.51)			(-0.48)	
age squared	-0.01		0.004			0.003	
	(-0.81)		(0.52)			(0.008)	
male	-0.64	**	-0.89	***		-0.87	***
	(-2.14)		(-2.63)			(-2.98)	
secondary education	-0.37		0.23			0.65	***
	(-0.80)		(0.67)			(2.84)	
higher education	0.44		0.02			0.63	*
	(0.97)		(0.04)			(1.85)	
university education	-0.06		0.60			1.06	**
	(-0.11)		(0.90)			(2.17)	
married	-0.35		0.21			2.97	***
	(-1.04)		(0.67)			(5.75)	
household head	-0.13		0.96	***		0.93	***
	(-0.38)		(2.75)			(0.30)	
household size (excl. migrant)	-0.03		0.01			-0.25	***
	(-0.22)		(0.07)			(-2.74)	
share of young children (0-6)	-0.07		2.13			3.94	***
	(-0.05)		(0.79)			(3.43)	
number of skilled adults (18-64)	0.19		-0.20			-0.42	***
	(0.80)		(-1.11)			(-3.10)	
share of elderly (>64)	-0.95		-1.62			0.89	
	(-0.69)		(-1.03)			(1.03)	
household farm	-2.49	***	3.83	***		-0.24	
	(-7.57)		(14.29)			(-1.44)	
mean regional plot size	-0.12		0.69	***		0.06	
	(-0.98)		(3.30)			(0.57)	
regional intensity of industrial production	0.15	**	0.09			0.16	***
	(2.24)		(1.57)			(3.17)	
regional density of physicians	-0.11	***	-0.07	*		-0.05	
	(-2.81)		(-1.78)			(-1.21)	
regional density of schools	266.90		-817.66	***		-843.08	***
	(1.02)		(-3.69)			(-3.39)	
regional density of preschools	-492.58	*	-430.43	**		368.21	*
	(-1.79)		(-2.07)			(1.73)	
constant	-27.83		13.57			13.14	
	(-0.81)		(0.54)			(0.55)	
Log pseudolikelihood	-389.24						
rho	likelihood ratio test rho21=rho31=rho32=0: cho2(3)=46.12, Prob>chi2=0.00						
Number of obs.	506						
Wald chi2(58)	574.65						
Prob > chi2	0.0000						

*** indicate significance at a 1% level, ** at a 5% level, * at a 10% level. t-statistics in parentheses.