

Explaining Labor Market Inactivity in Migrant-Sending Families: Housework, Hammock, or Higher Education?¹

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Abstract

This paper investigates the impact of emigration and remittances on labor market activity and time allocation of migrant-sending families. Departing from the common finding that labor market participation is lower in migrant households, we analyze in a unified framework whether the reasons for labor market inactivity, i.e. leisure consumption, home production and higher education are affected by migration. Based on household 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 labor substitution and a substantially higher likelihood of university enrolment.

Keywords: migration, remittances, labor market participation, time allocation, home production, higher education, Moldova

JEL classification: F22, J22, O15, C35

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1 Introduction

Many countries have witnessed large-scale emigration over the past decades. In parallel, remittances by migrants to their families have increased dramatically and become a central component of capital flows to developing countries. Migration and remittances have a strong impact on the development of migrant-sending communities. Amongst others, the departure of migrants and the subsequent receipt of remittances have been found to reduce household poverty levels, improve child health, and spur entrepreneurship (Adams, 2005; McKenzie, 2005; Woodruff and Zenteno, 2007).

Recently, the literature has paid more attention to the effects of migration and remittances on labor markets of source countries. A question of particular interest is how the departure of a household member influences the labor market behavior of those who stay behind. There is growing evidence that individuals in migrant households supply less labor, meaning that they work fewer hours and are less likely to be active on the labor market.³ Many studies have attributed this finding to potential disincentive effects of remittances including moral hazard problems.

The economic rationale for this interpretation is that regular transfers from abroad raise recipients' reservation wages and may also lower their work efforts, thus increasing their consumption of leisure. Supposedly, unearned income from remittances makes 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 effects were widespread, they would obviously have detrimental consequences 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, labor shortages and other adverse economic impacts.

Building on the non-separability of migration and remittances, this paper argues that reduced labor supply in migrant households is not necessarily due to increased leisure consumption. Instead, remaining family members might respond to migration and remittances by allocating more time to home production and higher education. The departure of a migrant implies that two helping hands might be missing for household duties, child care or work on the subsistence farm. Accordingly, individuals in migrant-sending households may provide less labor on the market because they find it more rewarding to get involved in home production activities. In addition, young adults in migrant families might be more likely to engage in higher education, be it due to the flow of remittances relieving credit constraints or migration-induced incentives for additional education. Pursuing college or university studies would then reduce young adults' labor supply.

3 E.g. Funkhouser (1992), Rodriguez and Tiongson (2001), Acosta (2006), Hanson (2005), Amuedo-Dorantes and Pozo (2006), Kim (2007), Grigorian and Melkonyan (2008), Lokshin and Glinskaya (2009), Binzel and Assaad (2009), and Mendola and Carletto (2009).

We contribute to the literature in two ways. First, we use a unified framework to test whether living in a migrant household affects an individual's probability (i) to be active on the labor market, (ii) to be voluntarily inactive (*disincentive effect*), (iii) to engage in home production (*labor substitution effect*), and (iv) to pursue higher education (*education effect*). This approach differs from the existing literature, which has not systematically accounted for the actual reasons for reduced labor supply. Our analysis draws upon an exceptionally rich and large household survey from Moldova, a country which has experienced high rates of outmigration during the past ten years. Second, we use a novel instrumental variable strategy that exploits the substantial diversity of first emigrants' destination choices to address the issue of endogenous selection into migration. Our instrument is based on the degree to which initial regional migrant networks in the different destination countries differentially exposed Moldovan regions to economic performance and job opportunities abroad, thus affecting the subsequent departure of new migrants.

In line with previous studies, we find that persons living in migrant households are significantly less likely to be active on the labor market. However, we cannot attribute this finding to the disincentive effect of remittances. Rather, our results are strongly in favor of the labor substitution and education effect.

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 setting and the dataset used for the analysis as well as the econometric strategy. Section 4 summarizes our empirical results and section 5 concludes.

2 Theoretical Considerations and Related Literature

This section first reviews the general literature on the labor market impact of emigration and remittances. We then discuss the theoretical considerations behind the disincentive, labor substitution and education effect and review the related empirical literature.

Funkhouser (1992) is one of the first to examine the labor supply effects of migration and remittances. Using simple probit regressions, he finds that the receipt of remittances is a negative determinant of labor force participation in Managua. Rodriguez and Tiongson (2001) investigate the labor market decision of migrant relatives in Manila. They find that having a migrant in the household strongly reduces remaining members' labor supply.

More recent research accounts for the potentially severe problem of endogenous selection into migration. Using an instrumental variable strategy, Acosta (2006) confirms previous findings for the case of El Salvador. Hanson (2005) employs parametric and non-parametric methods and shows that individuals in Mexico with a migrant abroad are less likely to participate in the labor force. Recent years have seen further studies on the effects of migration and remittances on labor supply (Amuedo-Dorantes and Pozo, 2006; Kim, 2007; Grigorian and Melkonyan, 2008; Lokshin and Glinskaya, 2009). However, to the best of our knowledge, the literature has not systematically examined the reasons for

reduced labor market activity in migrant households in a unified framework. Building on the non-separable impacts of migration and remittances (McKenzie and Sasin, 2007), we propose three potential explanations of labor market inactivity.

2.1 Disincentive Effect

The theoretical foundation for the disincentive effect follows directly from the neoclassical theory of labor supply. Under the usual assumption that leisure is a normal good, non-labor income raises the reservation wage of a potential worker. If the prevailing market wage is lower than her reservation wage, an individual is voluntarily inactive on the labor market. In our context, remittances from migrants abroad are a source of non-labor income and thus increase the reservation wage of the remaining household members. Assuming identical preferences and the same wage offer to similar persons in migrant and non-migrant households, the disincentive effect then suggests that persons in remittances-receiving households are less likely to participate in the labor market.

There is extensive evidence on the effects of non-labor income on labor supply. For developing countries, Rosenzweig (1980) and Schultz (1990) show that unearned income has a negative effect on labor supply. Bertrand et al. (2003) find that working-age adults reduce their labor supply in response to large pension transfers to elderly household members. Studying the labor market behavior of migrant-sending households, Rodriguez and Tiongson (2001), Acosta (2006) and Grigorian and Melkonyan (2008) suggest that lower labor supply in migrant households can be attributed to increased leisure consumption. Similarly, Fullenkamp et al. (2005) point to disincentive effects on work effort and even moral hazard problems as likely explanations for finding aggregate remittances flows to be negatively correlated with GDP growth.⁴

2.2 Labor Substitution Effect

The labor substitution effect can be derived from the neoclassical model of labor supply that allows for the production and consumption of non-market household goods.⁵ Under the assumption that home production is subject to diminishing marginal productivity, the absence of the migrant can raise the marginal productivity of home production for those who stay behind. If an individual was engaged in home production before migration, her departure may hence induce remaining household members to reallocate their labor from market work to work at home. *Ceteris paribus*, individuals in migrant households would then allocate more time to home production than their counterparts in non-migrant households.

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

5 Gronau (1977), Juster and Stafford (1991) or Chiappori (1997) show that it is crucial to distinguish between time used for home production and leisure time.

We are not aware of studies that explicitly estimate the effect of migration and remittances on intra-household labor substitution. Some authors, however, have noted the possibility of increased intra-household specialization of labor in migrant households (e.g. Acosta, 2006; Hanson, 2005).

2.3 Education Effect

The theoretical literature proposes two arguments for how migration and remittances affect educational investments in migrant-sending communities (Mountford, 1997; Stark et al., 1997; Stark and Wang, 2002). First, remittances can alleviate credit constraints, enabling receiving households to send their children to school or university. Second, the brain gain hypothesis proposes that the prospect of future migration can stimulate individuals to invest in human capital, as labor markets in destination countries typically offer higher returns to education than those at home.⁶ Given the direct access to the migrant network, the incentives for educational investments should then be stronger for members of migrant households.

Empirical studies on the impact of migration on education show rather mixed results.⁷ Hanson and Woodruff (2003), Cox Edwards and Ureta (2003), Mansuri (2006) and Yang (2008) provide evidence for a positive effect of migration and remittances on schooling using data from Mexico, El Salvador, Pakistan and the Philippines, respectively. Batista et al. (2007) and Chand and Clemens (2008) also find a positive impact of emigration on tertiary education. By contrast, Acosta (2006) reports that remittances-receiving households in El Salvador do not invest more in children's human capital. For Mexico, McKenzie and Rapoport (forthcoming) and McKenzie (2005) illustrate that migration might even discourage educational attainment. They argue that most Mexican migrants in the U.S. work in low-skilled jobs, so that young Mexicans have little incentives to invest in higher education. Under these circumstances, returns to education are ultimately higher in Mexico.

Taken together, the disincentive, labor substitution, and education effects define the optimal time allocation strategy. Under the assumption that production and consumption decisions are separable, an individual would supply labor 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. In this framework, the theoretical arguments from above suggest that, *ceteris paribus*, members of migrant households are likely to allocate less time to market work, but more time to home production, leisure,

6 Under certain conditions, these additional investments in human capital can outweigh the human capital loss brought about by the departure of high-skilled migrants. In this case, emigration would leave the country of origin with higher levels of human capital, leading to a brain gain.

7 Our focus in this short overview is on micro-level studies. Cross-country evidence is provided by Beine et al. (2008).

and higher education. The relative importance of the three effects, however, is difficult to establish a priori as it depends on local labor market characteristics, the availability of higher education and other socio-economic factors.

3. Empirical Strategy

3.1 Data and Setting

Our analysis draws upon data from Moldova's Labor Force Survey in 2008. The survey contains rich information on individuals' labor market activities as well as their engagement in home production including subsistence farming. It also provides detailed information on migration patterns at the individual level. The Labor Force Survey is nationally representative and with a sample of about 10,000 households the largest household survey in Moldova.

The sample is based on all individuals at working age (18-64 years) who were resident in Moldova at the time of the survey with the exception of early-age pensioners and individuals in compulsory military service. Besides, we do not include households with recently returned migrants as their time allocation might differ from both current migrant and non-migrant households. The sample also excludes households from the only two urban agglomerations in Moldova (Chisinau and Balti). Labor markets in these cities are structurally not comparable to those in the rest of the country. This leaves us with a final sample of 8,817 individuals out of which 1,601 reside in migrant households.

Moldova is a small, landlocked and densely populated country with large parts of the population living in villages or small towns. Having undergone a sharp economic decline after independence in 1991, Moldova remains the poorest nation in Europe. The economy is predominantly based on agriculture and related industries and has not experienced a promising structural change since independence.

In recent years, the country has witnessed large-scale outmigration. The regional economic crisis in 1998 is generally seen as the main trigger for mass emigration from Moldova. Starting from very low levels, the number of migrants has been rising steadily since then. Current estimates suggest that out of Moldova's population of 3.6 million at least half a million people have become migrants (Lücke et al., 2009). Poverty and access to migrant networks are the principal determinants of Moldova's massive emigration flows (Cuc et al., 2005; Görlich and Trebesch, 2008). Parallel to the growing rates of outmigration, remittances have considerably increased in recent years. According to the World Bank, the level of remittances has surpassed a share of 30 percent of GDP in 2008 (Ratha et al., 2009).

Similar to other CIS (Commonwealth of Independent States) migrant-sending countries like Tajikistan or Kyrgyzstan, the typical Moldovan migrant is male (62 percent), relatively young (35 years), comes from rural areas (74 percent) and engages in physical work. The

most popular destinations are Russia (57 percent) and Italy (21 percent). Other frequent destinations include Ukraine, Israel, and Turkey. Typically, only one family member works abroad (78 percent) so that large parts of the family stay behind (Tables A1 and A3 in the appendix; Mansoor and Quillin, 2007).

3.2 Definition of Dependent Variables

To test whether reduced labor supply in migrant-sending households is due to the disincentive, labor substitution or education effect, we would ideally observe the time allocation of each individual. Since the Labor Force Survey does not provide information on the amount of time spent in different activities, we have to resort to binary indicators of the four outcomes of interest: labor market activity, voluntary labor market inactivity, home production, and education.

An individual is defined to be active on the labor market if she is in any form of wage employment or self-employment. Farmers are included in this definition as long as they sell at least parts of their agricultural produce on the market. This classification is summarized in the dummy variable “*market work*”.⁸

To capture the disincentive effect, we construct the binary variable “*voluntarily inactive*”. This dummy variable takes the value of one if an inactive person reported voluntary inactivity as the main reason for not wanting to work.⁹ In line with our theoretical considerations, we suppose that these persons’ reservation wages are higher than the wages available to them so that they opt for leisure consumption.

The labor substitution effect is proxied by the dummy variable “*home production*” indicating that an individual was active in family duties, housekeeping or subsistence work on the household farm. According to our theoretical propositions, we assume that individuals engage in home production until they have equalized their marginal productivity to the wage rate.

The education effect is reflected by the binary variable “*education*”, which simply describes whether or not an individual was following any form of higher education. Investigating the education effect for adults is relevant in this context since Moldova features relatively high rates of secondary and tertiary education. Hence, the decision of additional investments in human capital becomes interesting only after the age of 18.¹⁰

8 Our analysis does not consider unemployed individuals. In the absence of meaningful unemployment benefits, official unemployment rates in Moldova are notoriously low. Most individuals would still engage in some kind of work, though they are often underemployed or have to work in the informal sector. In fact, the Labor Force Survey identifies only 150 unemployed persons in our sample.

9 Other answer categories included education or training, family responsibilities, disease and seasonal agricultural reasons. While there might be underreporting of voluntary inactivity, it is not obvious why reporting patterns should systematically differ between members of migrant and non-migrant households.

10 According to the Labor Force Survey, 91 percent of 15 to 17 year olds attended school in 2008.

Table 1 compares the activities of individuals in migrant and non-migrant households. In line with the empirical literature, living in a household with a migrant abroad is associated with considerably lower rates of labor market activity. Members of migrant families are also much more active in home production and engage more often in higher education. However, there are no indications that voluntary inactivity is significantly more common in migrant than in non-migrant households.

TABLE 1: ACTIVITIES OF INDIVIDUALS IN NON-MIGRANT AND MIGRANT HOUSEHOLDS

	Members of non-migrant households	Members of migrant households	Test of equality of proportions (probability of rejecting the null hypothesis of equality)
market work	77.33%	66.46%	0.00
voluntarily inactive	3.42%	4.00%	0.26
home production	45.69%	52.59%	0.00
education	9.47%	15.05%	0.00

3.3 Econometric Setup

The starting point for our econometric specification is the following four-equation model:

$$marketwork_i = c_1 + a_1migranthb_i + x_{i1}'\beta_1 + \varepsilon_{1i} \quad (1)$$

$$voluntarilyinactive_i = c_2 + a_2migranthb_i + x_{i2}'\beta_2 + \varepsilon_{2i} \quad (2)$$

$$homeproduction_i = c_3 + a_3migranthb_i + x_{i3}'\beta_3 + \varepsilon_{3i} \quad (3)$$

$$education_i = c_4 + a_4migranthb_i + x_{i4}'\beta_4 + \varepsilon_{4i} \quad (4)$$

where $marketwork_i$, $voluntarilyinactive_i$, $homeproduction_i$, and $education_i$ are the observed realizations of the respective latent variables.

Our regressor of interest is the binary variable $migranthb$ denoting whether an individual lives in a migrant household. We deliberately opt for an indicator of having a migrant abroad rather than receiving 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 and informational impact of a person abroad.¹¹ The vectors x_1 , x_2 , x_3 , and x_4 include other explanatory variables which control for observable differences between migrant and non-migrant households.

As argued above, the decisions to work, to consume leisure, to engage in home production or follow education are not independent of each other. An individual allocates her time to equalize the marginal returns of each activity including the marginal rate of substitution between consumption and leisure. As a result, the error terms ε_{1i} , ε_{2i} , ε_{3i} , and ε_{4i} are likely to be correlated and call for a simultaneous estimation approach (Maddala, 1983). Under the assumption that the error terms are drawn from a multivariate normal

¹¹ Including both $migranthb$ and a variable capturing remittance flows would ignore the non-separability of migration and remittances. According to the Labor Force Survey, 77 percent of Moldovan migrants send money to their families. As stated in McKenzie and Sasin (2007), disentangling the impact of migration and remittances is inherently difficult and remains an unresolved empirical challenge.

distribution with a mean of zero and a variance-covariance matrix Σ with values of 1 on the leading diagonal and correlations of the form $\rho_{jk}=\rho_{kj}$ as off-diagonal elements, equations 1-4 can be jointly estimated with the multivariate probit model. Since the evaluation of the resulting likelihood function involves the computation of multivariate normal distribution functions, it is based on simulated maximum likelihood using the Geweke-Hajivassiliou-Keane smooth recursive simulator (Greene, 2008; Cappellari and Jenkins, 2003 and 2006). The appropriateness of the multivariate probit model can be assessed by testing whether the pair-wise correlations between the error terms are jointly significantly different from zero. If this is not the case, equations 1-4 could be estimated separately with simple univariate probit models.

3.4 Identification

Unobserved characteristics between migrant and non-migrant households constitute a major challenge in estimating the causal impact of migration and remittances on the activity choices of those who stay behind. If such characteristics are correlated with both migration and time allocation patterns, any observed differences between members of households with and without a migrant might have already existed before the departure of the migrant. Depending on the direction of self-selection into migration, we would then over- or underestimate the true effect of *migrantbh*.

Following Maddala (1983), we estimate a recursive multivariate probit model to address the potentially endogenous nature of the binary variable *migrantbh*. The resulting simultaneous-equation model comprises the previous four activity equations and a fifth equation to account for selection into migration:

$$migrantbh_i = c_5 + \gamma z_i + x_{i5}'\beta_5 + \varepsilon_{5i} \quad (5)$$

Assuming that the error terms of the reduced-form equations 1-4 and the structural equation 5 are multivariate normally distributed, the estimation of the full recursive system follows the same procedures as described above (Greene, 2008).

Identification of recursive multivariate probit models rests on the exclusion restriction. Like in the standard linear IV case, this restriction requires the presence of at least one variable, the instrument z_i in the structural equation that is excludable from the reduced-form equations (Maddala, 1983).

Our instrumental variable strategy rests on the differential degree to which Moldova's 35 different districts have been exposed to demand for migrant labor from abroad. The central idea is that economic conditions in the foreign destinations determine job opportunities for new migrants, which already established migrants then channel to their home communities. Migrant networks have been shown to play a pivotal role in shaping migration flows by providing information on jobs abroad and lowering migration costs for subsequent migrants (Munshi, 2003; Winters et al., 2001.; Carrington et al., 1996). This observation also applies to Moldova, where local migrant networks are among the

principal determinants of migration (Görlich and Trebesch, 2008). The overall strength of the signal transmitted back home ultimately depends on the size and composition of the established migrant population abroad. *Ceteris paribus*, districts with an initial migrant network at a booming destination would subsequently experience more outmigration than districts with a network of the same size at an economically depressed destination. Over time, economic conditions abroad would exogenously determine growth of a given migration network and ultimately drive current migration flows. Our identifying assumption is that previous district-level exposure to demand for migrant labor from abroad does not affect time allocation patterns directly, but only indirectly through its impact on the current propensity of migration at the household level.¹²

For each district k , we measure exposure to economic conditions abroad as the weighted sum of destination countries' GDP growth between 1999 and 2007, where the weight for each destination j is given by district k 's prevalence of migration to country j in 1999:

$$exposure_k = \sum_j (growth_{j1999-2007} * prevalence_{kj1999}) \quad (6)$$

As an alternative to GDP growth, we also consider absolute changes in the unemployment rates for the period 1999-2007. GDP and unemployment data are taken from the World Development Indicators, district migration patterns come from census data.

Table 2 summarizes GDP and unemployment statistics for Moldova's six most important destination countries in 1999. Most countries experienced considerable GDP growth and also saw unemployment decline between 1999 and 2007. However, there are remarkable differences between countries. While Russia and Ukraine could boost their GDP by about 75 percent, Italy's economy only expanded by 12 percent. Similarly, Turkey's unemployment rate increased by two percentage points, whereas Russia, Ukraine, but also Italy were able to reduce their unemployment rates by more than five percentage points. These figures illustrate that there has been substantial variation in economic conditions in the different destinations.

Table 3 shows district-specific prevalence of emigration to the same countries in 1999. Both overall emigration prevalence and the direction of emigration flows varied tremendously across districts. Although Russia was the most common destination, the share of migrants to Russia was on average lower than 50 percent and in some districts even as low as 20 percent. Moreover, emigrants from different districts often concentrated in different sets of destinations. Based on this initial stock and distribution of migrants, one can expect that different districts have experienced varying degrees of exposure to demand for migrant labor from abroad.

¹² McKenzie and Rapoport (2007) employ a related identification strategy. However, when calculating the push factors from abroad, they only consider the single most important destination city in the US for each Mexican village.

TABLE 2: GDP GROWTH AND CHANGES IN UNEMPLOYMENT RATES IN SIX MAJOR DESTINATION COUNTRIES

	Russia	Italy	Romania	Greece	Ukraine	Turkey
GDP growth 1999-2007 (percent)	72.52	12.31	54.11	39.54	77.40	49.25
change in unemployment rate 1999-2007 (percentage points)	-7.40	-5.60	-0.40	-3.60	-5.20	2.20

Source: World Development Indicators.

TABLE 3: CENSUS-BASED EMIGRATION RATES (PER 10,000 INHABITANTS) TO SIX MAJOR DESTINATION COUNTRIES IN 1999, BY DISTRICT

District	Russia	Italy	Romania	Greece	Ukraine	Turkey	Overall	Share of migrants to Russia	Total number of migrants
Mun. Chisinau	7.23	6.01	3.88	3.90	1.11	0.77	32.70	22.11%	2329
Mun. Balti	32.61	4.47	4.31	5.88	1.73	0.31	56.84	57.38%	725
Anenii Noi	28.64	6.73	4.65	4.28	1.71	2.33	58.38	49.06%	477
Basarabeasca	20.02	14.49	2.76	13.11	5.52	2.07	66.26	30.21%	192
Briceni	9.61	2.18	1.41	0.64	2.82	0.13	20.76	46.30%	162
Cahul	27.59	9.98	9.90	7.55	2.18	4.19	74.56	37.01%	889
Cantemir	20.50	9.00	6.17	3.50	0.33	1.00	47.50	43.16%	285
Calarasi	11.06	15.72	4.66	3.20	0.93	0.40	47.15	23.45%	354
Causeni	24.61	5.08	4.08	1.77	3.09	0.44	42.16	58.38%	382
Gimislia	20.35	23.47	4.43	3.45	1.31	0.33	76.65	26.55%	467
Cruleni	10.24	6.64	3.32	3.60	0.00	0.28	28.37	36.10%	205
Donduseni	23.26	1.51	2.15	0.00	3.23	0.00	33.38	69.68%	155
Drochia	9.76	1.72	3.90	1.72	0.34	0.00	18.26	53.46%	159
Dubasari	7.06	1.18	2.65	2.94	0.88	0.29	19.40	36.37%	66
Edinet	20.52	2.33	2.95	1.47	2.21	0.49	32.56	63.02%	265
Falesti	23.03	2.21	3.21	1.99	1.00	0.33	32.44	70.99%	293
Floresti	16.00	4.36	3.02	1.12	0.34	0.22	27.41	58.37%	245
Glodeni	21.48	5.58	3.44	2.62	2.30	0.16	37.88	56.71%	231
Hîncesti	11.19	14.86	2.76	8.18	0.42	1.09	45.76	24.45%	548
Ialoveni	13.41	6.14	3.58	1.54	0.51	1.02	33.47	40.06%	327
Leova	27.42	7.05	6.86	2.35	0.78	1.57	53.47	51.28%	273
Nisporeni	7.86	14.63	8.01	4.16	0.31	0.31	39.89	19.69%	259
Ocnita	33.98	0.35	2.48	0.53	3.89	0.00	45.13	75.29%	255
Orhei	13.50	6.62	6.88	4.64	1.29	0.34	41.63	32.44%	484
Rezina	16.84	2.70	6.24	1.25	0.83	0.00	32.22	52.26%	155
Rîscani	19.01	1.87	6.19	1.87	0.14	0.43	32.11	59.19%	223
Sîngerei	17.90	7.46	3.67	0.69	1.49	0.34	36.72	48.75%	320
Soroca	14.00	3.05	4.63	4.11	0.95	0.21	30.43	46.02%	289
Straseni	11.47	9.79	6.30	5.96	0.56	0.68	44.77	25.63%	398
Soldanesti	10.42	5.21	3.08	0.95	0.24	0.00	21.79	47.83%	92
Stefan Voda	8.78	2.98	3.26	0.71	2.55	0.14	21.39	41.06%	151
Taradia	22.48	4.40	2.78	3.24	6.49	3.48	66.51	33.80%	287
Telenesti	13.55	5.28	6.27	1.28	1.00	0.29	30.23	44.81%	212
Ungheni	23.79	5.07	5.79	1.90	1.18	0.36	41.07	57.93%	454
U.T.A. Gagauzia	16.06	0.39	0.77	0.00	1.03	9.19	29.49	54.47%	459

Source: Census of the Republic of Moldova in 2004.

FIGURE 1: REGIONAL EXPOSURE TO PREVIOUS GDP GROWTH ABROAD AND CURRENT MIGRATION PREVALENCE

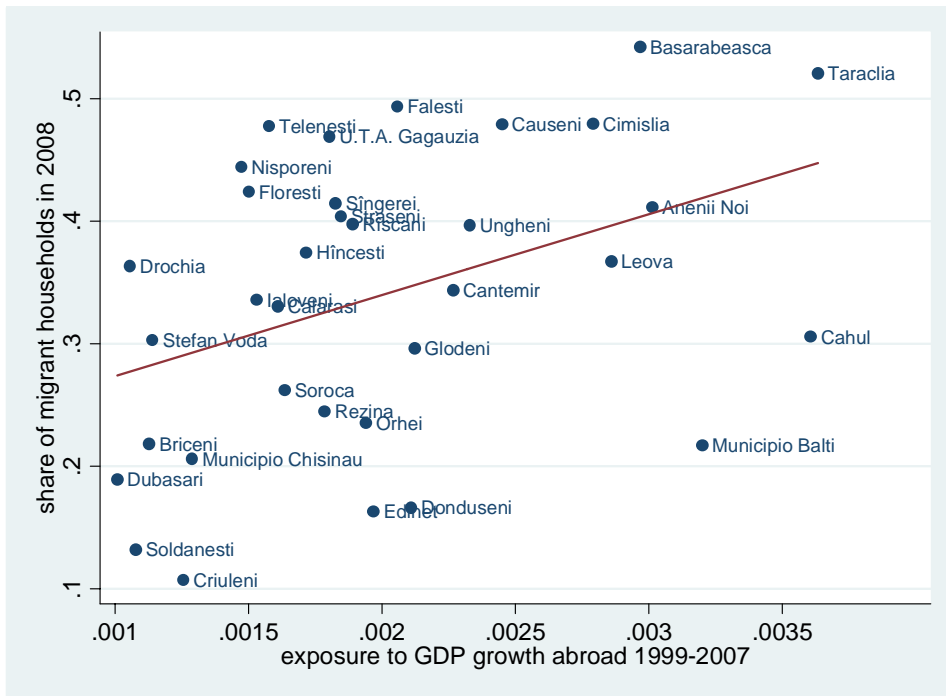
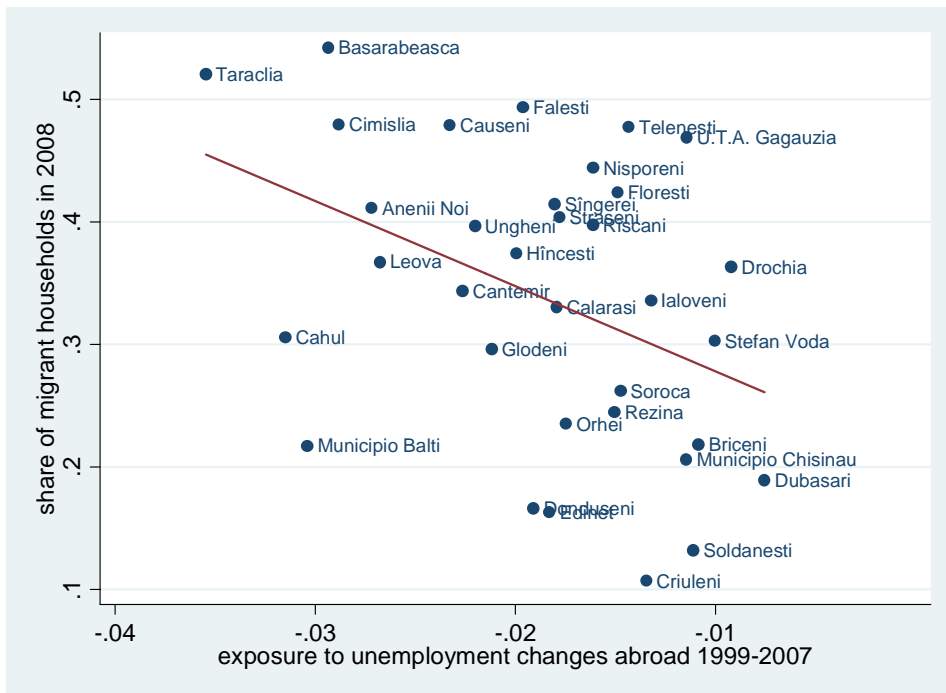


FIGURE 2: REGIONAL EXPOSURE TO PREVIOUS UNEMPLOYMENT CHANGES ABROAD AND CURRENT MIGRATION PREVALENCE



Figures 1 and 2 demonstrate that our instruments are indeed highly correlated with current migration prevalence. Districts that were previously exposed to higher GDP growth or larger reductions in unemployment abroad report substantially higher shares of households with a migrant abroad.

A potential concern for the validity of our instrument is that persistent labor market conditions at home might be a determinant of migration in both 1999 and 2008. We argue that this is unlikely to be the case as emigration was still a very minor phenomenon and just starting to take off in 1999. In total, the census registered only 13,067 emigrants. In other words, average migration prevalence was a mere 0.0036 percent in 1999 and even lower in many districts. Also taking into account that these first migrants left for so many different destinations, we make a case that emigration patterns in 1999 were not systematically related to labor market conditions at home, but rather the outcome of other factors like kinship or friendship ties. Nevertheless, to address this concern, our estimations control for a wide range of labor market characteristics at the district and locality level.

To test the robustness of our identification strategy, we also make use of an alternative approach suggested by Wilde (2000). He has theoretically shown that identification of recursive multivariate probit models is possible without the exclusion restriction as long as there is sufficient variation in the data, i.e. each equation contains at least one varying exogenous regressors.

3.5 Control Variables

While the identification strategy is designed to deal with unobserved heterogeneity, a number of explanatory variables at the individual, household, community and district level are used to capture observed heterogeneity between migrant and non-migrant households.

Individual characteristics comprise age, education, gender, marital status and position in the household. We control for household composition by including the number of young and older children, working-age adults and elderly members.¹³ A household's income-generating possibilities are proxied by the number of members with higher education and a dummy variable indicating whether the household has a farm. In a given context, this set of individual- and household-level variables should reflect important determinants of an individual's time allocation.

As discussed above, it is essential to control for local characteristics to identify the impact of migration and remittances. These characteristics constitute potentially confounding factors that affect both the propensity of outmigration and the decision to engage in

¹³ As the Labor Force Survey only identifies migrants who are still considered to be member of the household, we treat migrants like household members when computing household composition variables. Our decision is backed by the fact that most migrants leave their families only on a seasonal basis (Lücke et al., 2007).

market work, home production or higher education or to be voluntarily inactive. We address this concern by drawing on unusually rich data on the local and regional structure of employment patterns and development disparities provided by the Ministry of Economy and Trade and the National Bureau of Statistics. Specifically, we include the number of non-agricultural enterprises, the distance to the nearest city, the population size and the level of local tax revenues for each locality to capture the intensity of economic activity. We also control for district-level unemployment rates and wage levels. Moreover, we add the share of ethnic Moldovans in each district to deal with ethnically motivated migration and employment choices.¹⁴ Finally, we also include the share of working-age individuals who were involved in the activities under consideration. These variables are thought to reflect locality-specific patterns of market and non-market work and voluntary inactivity.

4 Results

Table 4 displays the marginal effects of migration and remittances on the activity choices of those left behind. Full regression results for the base specification are provided by Table A4 in the appendix. The first column presents the results for our base specification, where we instrument migration at the household level with previous exposure of a household's district to GDP shocks abroad. Throughout our specifications, the instrument is highly significant at the one percent level, thus not indicating a weak instrument problem. Most of the estimated coefficients of correlation of error terms between the different activities including migration turn out to be highly significant. In other words, unobserved factors in the different equations are significantly correlated, which suggests that selection into migration is endogenous to our outcomes of interest and that it is more appropriate to estimate the four activities jointly rather than separately.¹⁵

In line with the previous literature, we find that members of migrant households have significantly lower rates of labor market activity. Living in a migrant household decreases the probability of being active on the labor market by more than 10 percentage points.

There is no evidence, however, that reduced labor supply is due to the disincentive effect. Individuals with a family member abroad are not more likely to be voluntarily inactive on the labor market than individuals in non-migrant families. The corresponding marginal effect is very small and far from conventional significance levels.

14 Although Moldova is relatively homogenous in terms of ethnic composition, there are some regional concentrations of ethnic minorities like the Gagauz in the South-West or the Ukrainians in the North.

15 A formal test of endogeneity corresponds to testing the joint significance of ρ_{51} , ρ_{52} , ρ_{53} and ρ_{54} . The null hypothesis of joint insignificance can be rejected ($\chi^2(4)=475.46$, $\text{Prob}>\chi^2=0.000$). Likewise, pair-wise correlations between the error terms of the four activities are jointly significantly different from zero ($\chi^2(6)=449.14$, $\text{Prob}>\chi^2=0.000$).

It rather seems that the labor substitution effect can account for low participation rates in market work. Being member of a migrant household significantly increases the probability of engaging in home production by about 14 percentage points. Thus, members of families with a migrant are presumably more productive in home production than their counterparts in non-migrant households. This finding supports our hypothesis that a household may reallocate labor from market work to work at home in order to take over the home production activities previously performed by the migrant.

TABLE 4: MARGINAL EFFECTS OF MIGRATION AND REMITTANCES ON ACTIVITIES OF INDIVIDUALS IN NON-MIGRANT AND MIGRANT HOUSEHOLDS

	Instrument: exposure to gdp growth abroad (base specification)	Young (18-27)	Without instrument	Instrument: exposure to unemployment changes abroad	Identification through variation in the regressors
market work	-0.104***	-0.142*	-0.060***	-0.103***	-0.102***
voluntarily inactive	0.004	-0.004	0.006	0.004	0.004
home production	0.139***	-0.086	0.089***	0.139***	0.139***
education	0.007**	0.171*	0.003*	0.007**	0.006*

***/**/* denote significance at the 1/5/10 percent level respectively. Marginal effects are computed holding all other variables constant at their mean and using the Stata command `mvppred`.

We also find strong evidence for the education effect. Having a family member abroad significantly raises the probability of following higher education by 0.7 percentage points. This effect may appear small, but one has to keep in mind that the sample includes all working-age adults. As enrolment in higher education is likely to be relevant for younger individuals only, we re-run the analysis and restrict the sample to individuals who are aged between 18 and 27 years (column 2).¹⁶ For these individuals, the education effect turns out to be very strong. Being a young member of a migrant household increases the probability of engaging in higher education by 17 percentage points.¹⁷ As discussed above, this positive linkage between migration and education might be explained by the potential of remittances to relieve credit constraints or by migration-related incentives to engage in education. The non-separability of migration and remittances, however, prevents us from discriminating between these two explanations. In contrast to the results for the full sample, the labor substitution effect does not apply to this subsample of young adults. This finding suggests that the time available to young members of migrant households is rather used for higher education and consequently not available for work at home.

For comparison, the third column presents the result of an ordinary multivariate probit estimation that ignores the endogeneity of migration. The marginal effects are generally of lower magnitude, but the ordering and direction as well as significance levels are not affected. The last two columns check the robustness of our findings to the use of our

16 Our complete sample includes only 22 individuals over the age of 27 who were following higher education.

17 In theory, this finding could also be due to remittances inducing students to take more time to complete their degrees. This scenario, however, seems implausible as there are no differences in the age distribution of students in migrant and non-migrant households.

alternative instrument, previous exposure to unemployment changes abroad, and to identification based on the variation in the exogenous regressors as proposed by Wilde (2000). In both cases, our previously reported results remain virtually the same.

One might argue that having a migrant member is just a proxy for having a working member in the household. As our sample is predominantly rural, a migrant and a full-time working member might have a similar impact on the time allocation of other household members. Both would be cash earners and not be able to heavily engage in home production activities. To verify that our findings are indeed related to living in a migrant household, we control for the number of full-time salaried or self-employed family members including migrants. The first column of Table 5 shows that our results are robust to the inclusion of this additional variable. Apparently, the permanent absence of a migrant working abroad causes stronger effects than a working member who remains at home.

TABLE 5: ROBUSTNESS CHECKS, MARGINAL EFFECTS OF MIGRATION AND REMITTANCES ON ACTIVITIES OF INDIVIDUALS IN NON-MIGRANT AND MIGRANT HOUSEHOLDS

	Control for number of full- time employers	Broader definition of voluntary inactivity
market work	-0.103***	-0.090***
voluntarily inactive	0.008	0.004
home production	0.154***	0.135***
education	0.008***	0.007**

***/**/* denote significance at the 1/5/10 percent level respectively. Marginal effects are computed holding all other variables constant at their mean.

Another issue of concern might be the way in which we measure the disincentive effect. So far, we have proxied the disincentive effect by voluntary inactivity. Yet, it could be that our choice is too narrow. To check this possibility we broaden the definition to also include inactive persons who were not looking for a job because they “did not know how and where to look for a job”, “did not feel professionally ready”, “thought that they would not find a job due to their age”, or “had unsuccessfully looked for a job before.” Column 2 shows that our results are not affected by this change in definition. We still do not find that reduced labor supply is attributable to the disincentive effect.

5 Conclusion

Living in a migrant household does not seem to be a systematic determinant of leisure-driven inactivity on the labor market. Rather, we find strong indications that migration increases the probability of being active in home production or higher education. However, our results should be interpreted with caution. We do not show that unearned income from remittances creates no disincentive effects at all. It could well be that individuals in migrant households remain active on the labor market but work less hours

to consume more leisure. Moreover, we cannot observe remaining members' productivity levels in home production and educational activities.

Still, our findings suggest that the concerns of remittances creating a culture of dependence in areas with high rates of outmigration might be overstated. In Moldova, many migrant households seem to use their additional resources to invest in the education of their young adults. Once these individuals complete their degrees, they may have higher income-generating possibilities and become less dependent on future remittances flows. Nonetheless, the long-term benefits of higher rates of education for the country are uncertain as those who studied may eventually follow their family members abroad and leave the country.

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Appendix

TABLE A1: CHARACTERISTICS OF MIGRANTS (N=3,639)

	Mean	Std. Dev.	Min	Max
age	34.623	11.017	15	64
male	0.622	0.485	0	1
secondary education	0.678	0.467	0	1
higher education	0.219	0.414	0	1
hh head or spouse	0.428	0.495	0	1

TABLE A2: CHARACTERISTICS OF NON-MIGRANT HOUSEHOLD MEMBERS (N=7,216)

	Mean	Std. Dev.	Min	Max
market work	0.773	0.419	0	1
voluntarily inactive	0.034	0.182	0	1
home production	0.457	0.498	0	1
education	0.095	0.293	0	1
age	40.599	13.074	18	64
male	0.486	0.500	0	1
secondary education	0.648	0.478	0	1
higher education	0.244	0.430	0	1
hh head or spouse	0.723	0.448	0	1
hh head or spouse has higher education	0.347	0.476	0	1
# children 0-6	0.248	0.548	0	3
# children 7-17	0.564	0.830	0	7
# adult members 18-64	2.519	0.962	1	6
# elderly members 65-	0.116	0.358	0	2
# members with higher education	0.609	0.883	0	4
farm hh	0.609	0.488	0	1
# non-agricultural enterprises in locality	87.302	157.696	3	800
distance to nearest city (in km)	16.983	14.550	0	66.111
locality per-capita revenues	0.922	0.290	0.179	2.174
locality population size	7108.702	8175.375	930	36764
rural	0.779	0.415	0	1
locality share of employed people	0.758	0.129	0.200	0.982
locality share of individuals involved in home production	0.463	0.280	0	0.946
locality share of voluntarily inactive people	0.035	0.050	0	0.259
district unemployment rate	0.009	0.005	0.004	0.043
district wage rate	2103.492	232.821	1689.200	2631.100
share of ethnic Moldovans in district	83.509	19.683	4.831	97.783
exposure to gdp growth abroad	0.002	0.001	0.001	0.004
exposure to unemployment changes abroad	-0.019	0.006	-0.035	-0.008

TABLE A3: CHARACTERISTICS OF MIGRANT HOUSEHOLD MEMBERS (N=1,601)

	Mean	Std. Dev.	Min	Max
market work	0.665	0.472	0	1
voluntarily inactive	0.040	0.196	0	1
home production	0.526	0.499	0	1
education	0.151	0.358	0	1
age	38.871	13.625	18	64
male	0.385	0.487	0	1
secondary education	0.665	0.472	0	1
higher education	0.194	0.396	0	1
hh head or spouse	0.697	0.460	0	1
hh head or spouse has higher education	0.297	0.457	0	1
# children 0-6	0.249	0.519	0	3
# children 7-17	0.668	0.826	0	5
# adult members 18-64	3.245	1.029	2	7
# elderly members 65-	0.086	0.297	0	2
# members with higher education	0.586	0.854	0	4
farm hh	0.637	0.481	0	1
# non-agricultural enterprises in locality	58.375	119.885	3	800
distance to nearest city (in km)	17.534	12.707	0	66.111
locality per-capita revenues	0.877	0.274	0.179	2.174
locality population size	5486.258	5990.443	930	36764
rural	0.850	0.357	0	1
locality share of employed people	0.731	0.139	0.200	0.982
locality share of individuals involved in home production	0.498	0.262	0	0.946
locality share of voluntarily inactive people	0.036	0.049	0	0.259
district unemployment rate	0.009	0.004	0.004	0.043
district wage rate	2083.893	249.107	1689.200	2631.100
share of ethnic Moldovans in district	82.066	23.301	4.831	97.783

TABLE A4: MULTIVARIATE PROBIT MODEL OF INDIVIDUAL ACTIVITIES

	(1) Market work		(2) Voluntarily inactive		(3) Home production		(4) Education		(5) Migrant hh	
	coef/se	marg. eff.	coef/se	marg. eff.	coef/se	marg. eff.	coef/se	marg. eff.	coef/se	marg. eff.
migrant hh	-0.359*** (0.093)	-0.104	0.087 (0.147)	0.004	0.351*** (0.085)	0.139	0.272** (0.138)	0.007		
age	0.205*** (0.011)	0.049	0.007 (0.019)	3.3E-04	0.071*** (0.011)	0.028	-0.362*** (0.019)	-0.005		
age squared	-0.002*** (0.000)	0.138	-2.4E-04 (2.3E-04)	0.004	-0.001*** (1.3E-04)	0.113	0.004*** (2.5E-04)	-0.007		
male	0.332*** (0.036)	0.086	0.042 (0.056)	0.002	-0.329*** (0.033)	-0.129	-0.414*** (0.058)	-0.008		
secondary education	-0.045 (0.035)	-0.013	0.003 (0.060)	1.1E-04	-0.049 (0.035)	-0.019				
higher education	0.619*** (0.061)	0.134	-0.062 (0.101)	-0.003	-0.097* (0.059)	-0.038				
hh head or spouse	0.101 (0.065)	0.027	0.062 (0.111)	0.003	0.403*** (0.066)	0.156	-0.408*** (0.129)	-0.011		
# children 0-6	-0.102*** (0.031)	-0.028	-0.066 (0.062)	-0.003	0.376*** (0.034)	0.149	-0.735*** (0.074)	-0.007	-0.040 (0.032)	-0.009
# children 7-17	0.059** (0.024)	0.015	-0.015 (0.041)	-0.001	-0.008 (0.021)	-0.003	0.069* (0.039)	0.002	0.148*** (0.019)	0.038
# adult members 18-64	0.096*** (0.023)	0.024	-0.013 (0.036)	-0.001	-0.145*** (0.021)	-0.057	0.040 (0.043)	0.001	0.435*** (0.016)	0.126
# elderly members 65-	0.156*** (0.058)	0.038	-0.073 (0.110)	-0.003	0.022 (0.056)	0.009	-0.044 (0.081)	-0.001	-0.006 (0.051)	-0.002
# members with higher education	-0.197*** (0.027)	-0.056	-0.008 (0.049)	-3.4E-04	0.004 (0.029)	0.002	0.097** (0.049)	0.002	-0.075*** (0.019)	-0.017
fam hh	-0.340*** (0.042)	-0.086	0.627*** (0.076)	0.025	0.517*** (0.038)	0.200	0.063 (0.066)	0.001	-0.209*** (0.039)	-0.051
# non-agricultural enterprises in locality	7.4E-06 (2.6E-04)	1.9E-06	5.7E-05 (3.9E-04)	2.5E-06	-2.0E-04 (3.0E-04)	-8.1E-05	-1.1E-04 (4.0E-04)	-2.2E-06	0.001** (3.0E-04)	1.4E-04
distance to nearest city (in km)	0.002 (0.001)	4.1E-04	-0.005*** (0.002)	-2.4E-04	-0.002 (0.001)	-0.001	-0.005** (0.002)	-9.8E-05	-0.001 (0.001)	-1.5E-04
locality per-capita revenues	0.041 (0.066)	0.003	-0.010 (0.106)	-1.2E-04	0.054 (0.058)	0.006	-0.234** (0.105)	-0.001	-0.312*** (0.069)	-0.021
locality population size	-8.6E-07 (5.2E-06)	-0.002	7.7E-06 (7.8E-06)	0.003	4.9E-07 (5.7E-06)	0.002	3.4E-06 (8.0E-06)	0.001	-2.9E-05*** (5.8E-06)	-0.049
rural	0.240*** (0.076)	0.067	-0.206** (0.102)	-0.010	-0.259*** (0.075)	-0.103	-0.210* (0.120)	-0.005	-0.009 (0.078)	-0.002
district unemployment rate	-1.249 (4.287)	-0.003	-5.333 (6.488)	-0.002	-3.369 (3.679)	-0.013	4.850 (6.586)	0.001	7.098** (3.445)	0.018
district wage rate	-3.2E-05 (7.4E-05)	-0.002	1.2E-04 (1.3E-04)	0.001	1.6E-04** (6.9E-05)	0.015	3.9E-04*** (1.3E-04)	0.002	-3.0E-04*** (7.5E-05)	-0.016
share of ethnic Moldovans in district	-0.022 (0.001)	-5.8E-05	-0.064 (0.001)	-2.8E-05	-0.154* (0.001)	-0.001	-0.189 (0.001)	-3.8E-05	-0.072 (0.001)	-1.7E-04
locality share of employed people	3.601*** (0.142)	0.009								
locality share of voluntarily inactive people			8.841*** (0.393)	0.004						
locality share of individuals involved in home production					3.366*** (0.078)	0.013				
hh head or spouse has higher education							0.374*** (0.101)	0.009		
exposure to gdp growth abroad									79.883*** (27.655)	0.013
constant	-6.661*** (0.289)		-2.608*** (0.497)		-3.431*** (0.262)		5.572*** (0.474)		-1.142*** (0.201)	

rho21=0.084*; rho31=-0.075*; rho41=0.010; rho51=-0.103; rho32=-0.253***;

rho42=-0.713***; rho52=-0.895***; rho43=0.200***; rho53=-0.130***; rho54=0.219***

log pseudolikelihood = -12647.249

likelihood ratio test of rho21=rho31=rho41=rho51=rho32=rho42=rho52=rho43=rho53=rho54=0

chi2(10)=1189.04; prob>chi2=0.0000

observations 8,817

***/**/* denote significance at the 1/5/10 percent level respectively (robust standard errors). Marginal effects are computed holding all other variables constant at their mean. They reflect the change in the predicted probability for a one-unit change in the continuous regressor under consideration. In case of dummy variables, the marginal effect reflects the discrete change from 0 to 1. For the variables “locality per-capita revenues”, “locality population size” and “district wage rate” marginal effects are calculated for a change by one standard deviation.