The Vanishing Farms? The Impact of International Migration on Albanian Family Farming

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Abstract

This paper investigates the impact of international migration on technical efficiency, resource allocation and income from agricultural production of family farming in Albania. The results suggest that migration is used by rural households as a pathway out agriculture: migration is negatively associated with both labor and non-labor input allocation in agriculture, while no significant differences can be detected in terms of farm technical efficiency or agricultural income. Whether the rapid demographic changes in rural areas triggered by massive migration, possibly combined with propitious land and rural development policies, will ultimately produce the conditions for a more viable, high-return agriculture attracting larger investments remains to be seen.

Key Words: migration, agriculture, farm households, farm inputs, technical efficiency.
JEL: O15, Q12.

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I. Introduction

The decreasing relative importance of the agricultural sector is a pervasive phenomenon of economic development which often entails sizeable population movements out of rural areas. These flows, whether towards urban areas or abroad, have traditionally been seen by local governments and international donors concerned with rural development issues as either something to favor – in order to meet labor demands of an expanding industrial sector or to alleviate poverty and unemployment in depressed rural areas by means of relocation of people – or something to prevent – in order to curb the hemorrhaging of the most productive workforce from agriculture and reduce pressure on overcrowded urban areas. Only recently policy makers have started realizing the potential of migration, and the remittances it generates, to improve conditions in the communities of origin and amongst households and individuals left behind.

Migration may affect sending households through a number of channels. The loss of family labor due to a temporary or permanent relocation can be (partly) offset by the potential income gains deriving from migrants' remittances. These positive income effects, which derive in part from a relaxation of credit and insurance constraints, may arise even in the absence of actual remittances, as the mere presence of a family member abroad may alter the investment and risk-taking behavior of individuals in sending households. However, members in these households may decide to reduce the amount of work effort and increase leisure time as a result of higher income from remittances. This may be particularly true for low-return and less attractive types of labor activities such as agriculture, thus raising concerns on the potentially deleterious impact of remittances on agricultural productivity and total production, both at the household and at the country level.

The basic premise to be investigated in this paper is that as a result of the changes in labor endowments and the potential income effects due to migration, household members left behind are likely to adjust their farm's technical efficiency and allocation of labor and non-labor resources in agriculture. Given the multiple paths through which migration is bound to affect these decisions, it is difficult to sign these relationships a priori. The available empirical literature on the topic is ambiguous; relatively few

empirical studies have been carried out, and for those that do, findings do not provide a consistent pattern.

Only recently has quantitative research begun to relate migration and farm production in Albania. Germenji and Swinnen (2004) find that remittances encumber farm efficiency in rural Albania due to reduced labor efforts. Azzarri et al. (2006) find that international migration networks are associated with a significantly lower probability of participation in the labor force by the remaining household members. However, while McCarthy et al. (2006) document a drop in the quantity of agricultural labor effort as well, they find a reallocation of land use towards less labor intensive production systems, particularly livestock, ultimately resulting in greater agricultural and total household income.

In analyzing the impact of migration on family farming decisions, this paper extends these earlier studies in two directions. First, we explore the linkages between migration and family labor allocation, testing for the hypothesis of an increasing feminization of agriculture as a result of international migration being male dominated. Second, we analyze the relationship between migration and investments in productivity-enhancing and time-saving technologies, testing the hypothesis that households are compensating for less agricultural labor effort with investments in capital intensive technologies.

The analysis in this paper is primarily based on data from the 2005 Albania Living Standards Measurement Study survey (ALSMS05), carried out by the Albanian Institute of Statistics (INSTAT) in collaboration with the World Bank. The remainder of the paper is organized as follows. In the next two sections, we first briefly introduce the Albanian context and then summarize some of the empirical literature on the topic. In Section IV, we describe the data and present some descriptive statistics. We continue in Section V by outlining the estimation strategy adopted and describe the empirical model. The estimation findings are presented in Section VI, before concluding in the last section.

II. Agriculture and Migration in Albania

Albania presents a uniquely interesting scenario in which to assess the impact of migration on agriculture. Despite an unimpressive performance in recent years and a

gradual contraction of the agricultural sector, agriculture remains a sector of vital importance for the national economy and the livelihood of a large share of the population. More than 15 years into transition, Albania remains predominantly rural: 54 percent of the population reside in rural areas (World Bank, 2004) and agriculture still employs approximately 50 percent of the workforce, providing an income source to more than 90 percent of the households in the more remote North-eastern part of the country (McCarthy et.al., 2006).

The agricultural reforms carried out in the post-communist period, and the resulting land redistribution, led to a highly fragmented sector. Albania's land reform was unique among transition countries for its rapidity and intensity: by the mid-1990s, 94 percent of farmland had been privatized (The World Bank, 2004), with 550 state and collective farms split into 460,000 privately owned farms, averaging only 1.1 hectares per farm (World Bank, 2004; MOAFCP, 2005). Albania has had the highest de-collectivization index of all transition economies in Eastern and Central Europe, but differently from these other countries, redistribution was not based on restitution and benefited all rural households (Cungu and Swinnen, 1999).

The sector remains plagued by a plethora of problems, including low productivity and outdated technologies. The labor market for agricultural work is very thin[1], while formal rural credit and insurance markets remain virtually non existent. Promoting a viable agriculture thus involves removing these constraints, and rural out-migration is seen as potentially playing an important role in ameliorating some of these constraints, while possibly exacerbating others.

Concurrently with this transformation of the agricultural sector, over the past 15 years Albania has experienced one of the most extraordinary migration outflows in recent history. Particularly affected have been rural areas, where the majority of these flows originate. Based on 2005 data, one household in three have at least one former member living abroad, mainly to Greece or Italy. About two thirds of these migrants are reported to remit, again with the highest prevalence among rural households.

[1] A strong negative social stigma is attached in Albania to being an agricultural wage laborer. This reportedly plays a big role in discouraging the emergence of an active farm labor market.

However, evidence relating migration and agriculture in Albania suggests that despite the positive effect that migration and remittances have had on improving the living conditions of the migrant-sending households, the link with productive agricultural investments may have not materialized. Empirical and anecdotal evidence indicate that only a small fraction of the remittances sent by international migrant is invested in agriculture (Civici et al. 1999; King and Vullnetari, 2003; Carletto et al., 2004). Also, qualitative evidence shows that there has been substantial reallocation of labor within the household; women and teenagers work longer hours in the family plots to compensate for the lack of male labor due to migration (King and Vullnetari, 2003).

III. Exploring the linkages migration-farming decisions: a brief literature review

Migration may affect farming and investment decisions in a number of ways, often in different directions. As a result, the ultimate impact is ambiguous, and contrasting findings are found in the literature.

Much of the recent empirical literature on the topic is based on the theoretical underpinnings of the New Economics of Labor Migration (NELM). According to this, perspective, migrants are viewed as financial intermediaries serving as surrogates for imperfect or missing formal insurance and credit markets (Stark and Levhari, 1982; Stark and Bloom, 1985; Stark, 1991). By diversifying risk and relaxing liquidity and credit constraints through remittances, migration can be seen as part of a household strategy to overcome these restrictions, thus inducing productive investments. However, these positive impacts may be offset by potentially adverse effects such as reduced household labor supply, weakened human capital and reduced labor efforts by members left behind.

A number of studies have provided empirical support to the positive impact of remittance on production despite its negative impact on labor availability at farm level (Stark, 1991; Taylor et al., 1996; Taylor and Wyatt, 1996). Taylor (1999) and Benjamin and Brandt (1998) provide some evidence that participation in migration relaxes risk and credit constraints on household farm investments. In his work on foreign mine workers in South Africa, Lucas (1987) finds that remittances positively affect the accumulation of cattle and crop productivity. Likewise, evidence on Burkina Faso suggests that inter-continental migration positively affects household income diversification into livestock

production, while it negatively affects non-farm activities (Konseiga, 2004). Mendola (2004) finds that in rural areas of Bangladesh, international migration enhances adaptation of new farming technologies. In the specific case of Albania, McCarthy et al. (2006), using data from the 2002 and 2003 Albania LSMS, provide evidence of net increases in agricultural (and total) income despite significant reductions in the allocation of labor to crop production. They attribute the improvement to a shift towards livestock as a result of the capital inflows and labor loss from migration.

Conversely, a number of other studies, dating back to the early 1980's, have posited that remittances, by facilitating the substitution of labor for leisure, may indeed result in non-increasing – or even lower – levels of income due to reduced labor efforts, and in lower productivity, due to the loss of the most productive and better educated segments of the population (Lipton, 1980; Palmer, 1985). This same hypothesis is also supported in studies by Azam and Gubert (2002), Itzigsohn (1995) and Germenij and Swinnen (2004), with remittances potentially contributing to farm inefficiencies. Similarly, Funkhouser (1992) and Rodriguez and Tiongson (2001) find lower labor participation as a result of the receipt of remittances. Amuedo-Dorantes and Pozo (2006) find no impact on male labor hours, though document changes in its composition, with less hours being worked in formal (*vis a vis* informal) sector. Along these same lines, when investigating the direct role of migration on agricultural production in rural China, Rozelle et al. (1999) found that migration exerts a direct negative effect on agricultural yields. As family members leave the farm, yields fall sharply, suggesting that on-farm labor markets are conspicuously absent in those parts of China. Finally, deBrauw and Rozelle (2002) show that the benefits of migration are mainly related to consumption and accumulation of durable goods, as well as house improvements, rather than to productive investments.

IV. Description of the Data

The data used in this paper are from the 2005 Living Standards Measurement Study survey (ALSMS05), carried out by the Albania Institute of Statistics (INSTAT) in collaboration with the World Bank, on a sample of 3,640 households. The ALSMS05 includes a typical household questionnaire covering general household demographics,

education levels, asset ownership, expenditures and labor market participation. In addition, the survey also provides community-level data, which include information on access to services and infrastructure in the locality, as well as price information. The ALSMS05, though, differs from a typical LSMS in at least two ways. First, the household questionnaire includes an unusually detailed module on migration, both internal and international, of both current and former household members. Second, the questionnaire administered in the Spring contained a short module for the proper identification of farm households within the nationally representative sample. A detailed farm survey was fielded the following Fall on a sample of 1,849 farm households, as identified in the Spring visit. These farm households form the basis for the analysis in this paper.

Table 1 presents descriptive statistics of the variables used for the analysis, by migration status. A household is classified as a migrant household if, at the time of the survey, it had a former household member (mostly adult children of the household head) currently living abroad. Based on this definition, 33.4 percent of the sample has at least one international migrant. Of these, 50.4 percent has more than one former household member abroad.

Significant differences are found in the average number of hours worked in agriculture by households in the two groups, as well as in the amount of labor effort in agriculture by the males in the household. Despite owning more land on average, households who have individuals currently migrating abroad devote less hours to agricultural labor, mostly driven by considerably lower work effort by male members of the household. No significant differences are found across groups in the number of hours worked by female household members, either in total or per capita terms.

Similarly, no significant difference across groups is detected in the farm's technical efficiency and level of total household agricultural income. However, households with migrants exhibit significantly higher total incomes. Although no significant differences exist across groups in the shares of households purchasing or renting non-labor farm inputs, migrant households spend more on average on both equipment rental and chemical input expenditures. However, the average amounts spent by households in each groups are rather low, confirming the inadequate level of

capitalization among Albanian farmers, regardless of migration status: on average, migrant households still only spend 15,474 Leks per year (approximately 150 US dollars[2]), compared with 11,427 Leks by non-migrant households. Similarly, the amount spent on chemical inputs by migrant households is 13,521 Leks, versus only 9,973 Leks among non-migrant households.

Migrant households also own more land and land plots, live closer to public facilities and bus stops, and are more likely to live in communities where land disputes are reportedly a problem. As expected, they also have a higher percentage of female heads. Migrant households are of smaller size, and appear to be marginally less educated. In this respect, the smaller household size and education level could be (partially) attributed to migration, with the lower levels of education capturing the fact that Albanian migrants are positively selected (with the majority of them having completed at least secondary schooling): this is supported by earlier findings on Albania (Konica, 1999; Germenji and Swinnen, 2004).

Lastly, in terms of their spatial distribution, migrant households seem to be mainly located in the coastal areas. This again is an indicator of the high correlation between migration and vicinity to the host countries, with the coastal areas being closer to Greece and Italy, by and large the two main destination countries.

V. Empirical strategy

a) Econometric considerations

The relative scarcity of studies which analyze the impact of migration partly reflects the objective difficulties in assessing these effects due to a host of econometric issues. Although more efficient than 2SLS estimators, OLS estimates of the migration effect are generally deemed to be biased because the migration regressor is likely to be correlated with the error term. This bias may arise from a number of factors, including omitted variable bias, endogeneity due to reverse causality with the outcome of choice and measurement errors in the regressor. In this paper, we adopt an instrumental variable (IV) approach to control for this potential bias. The effect of migration is estimated by using an Instrumental Variable Tobit estimator. In the first stage, we estimate

[2] 1 USD was around 100 Leks at the time of the survey in 2005.

$$M_i = \mu + \gamma * I_i + \lambda' X_i + \varepsilon_i$$

where M_i represents the number of individuals that household i has currently living abroad; X_i includes the household and community characteristics; ε_i is the error term; and I_i is the vector of excluded regressors from the outcome equation. In the second stage, the instrumented migration variable is included in the outcome regressions:

$$Outcome_i = \alpha + \beta M_i(hat) + \delta' X_i + \nu_i$$

where $M_i(hat)$ are the predicted fitted values from the first stage regression, X_i is the same vector of explanatory variables, ν_i is the error term, and β is the unbiased and consistent estimation on the average effect of migration on the outcome of choice.

The issue in IV estimations is to find instruments that predict migration, but that do not have an effect on the outcomes of interest. In this respect, the instruments need to be contemporaneously uncorrelated with the error term, while also being correlated with the endogenous regressor for which they serve as an instrument (Kennedy, 2003). Finally, the instruments must be shown not to belong in the second regression, i.e. they are not correlated with the outcome of choice. When it satisfies these conditions, the instrument is considered valid. However, even a valid instrument may be weakly correlated with the endogenous regressors being instrumented. For this reason, the chosen instrument(s) must also be tested for "strength".

In our specific case, another complication is due to the fact that some of our chosen outcomes are censored. Consequently, OLS estimators may not be appropriate and limited dependent variable specifications must be adopted. However, no proper tests exist to ensure validity and strength of the instruments for this class of models. For this reason, we run the diagnostic on the uncensored specification and then use the selected instruments in the censored specification.

b) In search of the holy (instrumental) grail

Although empirical studies adopting an IV approach have mushroomed in recent years, much heterogeneity exists in the argumentation provided of why the chosen instruments are appropriate. As noted in Murray (2006), much of the credence to be granted to the instruments has to do with the quality of the line of argument. However, a number of tests also exist to support the purported validity and strength of the instruments adopted. In this paper, we start by trying to make a convincing argument for the use of

certain variables available to us from either the ALSMS05 or the 2001 Population Census, and then select the most appropriate instruments through a number of diagnostic tests.

One of the main features characterizing migration, and in particular the choice of destination, was the knowledge of the language of the destination country. Knowledge of either Greek or Italian at the onset of the migration flow in 1990 by a household member, besides making the destination country more attractive by lowering the costs of assimilation, may also reflect affinity in culture and mentality, as well as geographical vicinity. This familiarity with the language spoken in the host country has been noted to be an important factor in determining the direction of migration in Albania (IOM, 2005). As a result, migrants from the South and Southeast areas of Albania still comprise the majority of migrants to Greece. These areas are closer to Greece, and Greek is widely spoken there due to presence of Greek minorities. On the other hand, migrants from the Coastal and Central areas comprise the majority of the migrants to Italy. As with Greek, a central characteristic of these areas is the familiarity with the Italian language, mainly due to the popularity of Italian television channels prior to and following the fall of communism. Thus, knowledge of languages by the migrant or other household members in 1990 is considered a good predictor of their migration decision. Additionally, the fact that exposure to these languages was almost uniformly dependent on location and cultural background, and was mainly induced by exogenous factors such as the presence of Greek minorities and Italian channels and not a reflection of differences in education or skills, suggests that knowledge of languages in 1990 may be considered exogenous to our outcome variables. Thus, dummy variables indicating knowledge of Greek or Italian language by the migrant or anyone in the migrant's household in 1990 is proposed as an instrument in the analysis.

The use of migration networks to identify migration has been widely used in the literature (McKenzie, 2005; Woodruff and Zenteno, 2001; McCarthy et al., 2006; Rozelle et al., 1999, Taylor et al, 2003). Previous migration, and the resulting formation of social networks abroad, is assumed to promote further migration by lowering the costs, both monetary and psychological, of the move. Based on data from the 2001 Population and Housing Census of Albania, we construct a variable measuring the share of the male

population between the ages of 20 and 39 for each of the 374 communes/municipalities and use it as an additional instrument. A lower percentage of this variable is associated with higher levels of migration in the commune/municipality, thus indicating the presence of a larger migration network abroad. Furthermore, the local availability of male workers can be assumed to be exogenous to agricultural labor decisions due to the extremely thin agricultural labor markets in rural Albania. Very few farm households (7.6%) hire labor in agriculture, and this was the pattern even prior to the unfolding of massive out-migration.

Lastly, we also use as instrument the minimum distance between the household and the two border crossings with Greece (Kakavije and Kapshtice). Distance can be assumed to discourage migration by raising transaction costs. Similarly to the language variable, it is possible for the distance instrument to also capture affinity with the customs and culture over the border and lower information costs. For this reason, the language and distance instruments we end up using in our regressions are the two – within a pool of possible distance variables[3] – that best identify migration.

c) Variable Description

In our analysis the dependent and explanatory variables described in the reminder of this section are used.

Dependent Variables:

Agricultural Labor: Household agricultural labor is measured as the total number of hours spent working in agriculture by all current members, both in total and per capita terms. The sign of the impact of migration on both total and per-capita allocation is ambiguous. On the one hand, migration has a direct impact on total availability of family labor. Although this drop could (in part) be compensated by those household members left behind by working more hours, the opposite would also occur due to higher demand for leisure following improvements in income. Furthermore, this impact may very well differentiate across gender lines, as women may be left with additional on-farm responsibilities as a result of a still predominantly male migration. For this reason, we also estimate the same total and per capita models by gender.

[3] Distances to the port cities of Durres and Vlora, main exit points to Italy were also considered as possible instruments. However, the instrument, whether taken alone or in combination with the distances to border crossings, did not pass the overidentification tests and thus were excluded.

Non-labor input expenses in agriculture: The total farm household expenses for the purchase of chemical inputs and rental of farm equipment are computed, as well as total expenditures in livestock production. Total expenditure in chemical inputs, which include expenses in both fertilizers and pesticides, is meant to capture the adoption of productivity-enhancing technologies by the farm household. Livestock expenditure includes livestock feed, veterinary services, medicines, supplements, vitamins, livestock transport, and other livestock expenditures. The hypothesis is that migration, by relaxing the household credit and liquidity constraints, will foster higher expenditures in capital intensive inputs *vis a vis* labor, and more capital intensive types of production such as livestock. As discussed by McCarthy et al (2006), households with migrants abroad may be more prone to invest in livestock than in traditional, labor-intensive agriculture.

Income: We also look at the impact of international migration on agricultural, and total household income, all in logarithmic forms. In the case of household agricultural income, a priori the overall effect is again ambiguous, as it will depend on the final allocations of labor and non-labor inputs. The same is true for total income, as much will depend on whether the income effect of migration more than offsets the changes in the level and composition of total labor supply.

Technical Efficiency: The farm's technical efficiency measures the distance between the farm and a point on the production or cost frontier through an efficiency index using a stochastic frontier approach (Savastano et. al, forthcoming). Each point on the frontier represents the maximum potential output given a set of inputs. Technically efficient farms lie on the production frontier[4], while inefficient farms lie below their production function or above their cost function (Savastano et. al, forthcoming). The expected effect of migration on farm's technical efficiency is ambiguous. On the one hand, proceeds from migration can be used to improve technology levels on the farm; on the other hand, however, potentially lower labor efforts and and the aspiration to seek opportunities outside of the farm can negatively effect technical efficiency.

Independent Variables:

[4] A production frontier represents the maximum amount of output given a certain technology and input bundle. A cost frontier represents the minimum cost possible to produce a given level of output (for more details see Savastano et. al., forthcoming).

Migration: The total number of former household members, in almost all cases children of the household head and/or spouse, living abroad is used as our variable of choice to measure international permanent migration. As it is likely to be endogenous, we instrument for this variable as explained earlier.

Human Capital: In our models, we control for a number of household-level characteristics to capture differences in human capital endowment. These variables include the age and gender of the household head, and the household size. Furthermore, differences in the education levels of the households are captured by the highest years of education in the household. Higher levels of education may be associated with lower participation in agricultural activities, higher use of capital intensive technologies and higher total income. More educated households have higher skills and opportunities of employment, and thus have more incentives to move away from agriculture.

Natural and Physical Capital: A number of variables are also introduced to control for differences in the ownership of physical assets associated with agricultural production. Specifically, we use total household land area measured in square meters, and the number of plots. This latter variable is used to account for the high level of land fragmentation resulting from the land redistribution of the early 1990s. Access to land is expected to have a positive effect on household agricultural labor and agricultural income. The effect of the number of plots however is ambiguous, since it depends on its relationship to the amount and quality of land. The total number of animals owned – measured in tropical livestock units (TLU) – is also included.

Community and Regional Characteristics: Regional dummies are used to reflect differences in agro-climatic conditions and other unobserved spatial characteristics. Rural Albania is divided into three agro-climatic regions, i.e. Coastal, Central, and Mountain regions; the Central stratum is used as the excluded referenced group in our regressions. Furthermore, a dummy variable on whether the community has experienced problems with land disputes is also included. Laws regarding land ownership are still ambiguous in Albania, thus generating frequent local conflicts over the issue of land ownership and use. Land disputes negatively affect the incentives to work the land and be engaged in agriculture, thus it is also expected to exert a negative effect on agricultural labor, input expenditures and income. Similarly, a variable reflecting the reported number

of crimes in the community is also included in the regressions. As reported in other studies on Albania (Castaldo et al., 2005; McCarthy et al., 2006), criminality is likely to deter involvement in production activities, and especially agriculture. Lastly, a distance index from public facilities is created through principle component analysis to capture accessibility of public facilities, which also serves as an indicator of household remoteness and, thus, access to markets and services. The index accounts for (i) distance from primary schools; (ii) distance from ambulatory facilities; and (iii) distance from the closest bus stop. Consequently, the higher the distance from these services, the higher the household isolation, thus reducing its choices of engaging in other activities except agriculture, and increasing the amount of labor devoted to agriculture.

VI. Estimation results

a) IV testing

There are no readily available tests for the validity of the instruments for censored variables as there are for continuous uncensored dependent variables. We thus run the relevant overidentification test using the *ivreg* command in Stata on the uncensored specification. To account for heteroscedastic errors, we generate Hansen's J statistics[5] to test for the joint hypothesis that the model is correctly specified, and the orthogonality condition is satisfied. A rejection of the null hypothesis indicates that either the instrumental variables are wrongly excluded from the regression, or the orthogonality condition is not satisfied. Estimated J-statistics for each regression are reported at the bottom of table 2-4 and show that the null hypothesis cannot be rejected and our instruments are valid.

A valid instrument may still be "weak". The consequence of using instruments with little explanatory power is larger biases in the estimated IV coefficients (Hahn and Hausman, 2002), thus potentially rendering the use of instrumented models less beneficial *vis a vis* non-instrumented estimators. For this purpose, we also run a joint significance test of the instruments in the first stage regression to test for their relevance. As suggested in the literature (Steiger and Stock, 1997), as a rule of thumb we use a value

[5] We use Hansen's J statistics instead of the Sargan test because of the assumption of heteroscedastic errors. The two tests are equivalent in the case of homoscedasticity.

of 10 of the F statistic to conclude with some confidence that the chosen instruments are "strong". The estimated Cragg-Donad F statistics reported below the regression results consistently show that the chosen instruments are indeed relevant and sufficiently "strong"[6].

b) Assessing the impact of migration

In Tables 2-4, we report the estimated coefficients and the relevant diagnostic statistics for all outcomes of choice. Starting in Table 2 with the impact of migration on agricultural labor, all models consistently support the view that migration of a household member has a negative effect on the household labor effort in agriculture, both in total and per capita terms. This is also true across gender lines, although we find a more sizable drop for male labor. Although the larger drop in total male labor, *vis a vis* female labor, could be expected in view of a still predominantly male migration, the larger drop in per capita terms is puzzling. One possible reason is that male household members, more than women, take advantage of the improved income and relaxed credit constraint to get involved in non-agricultural types of activities, for instance because returns to rural off-farm labor are greater for men. An alternative explanation is that the income from migration is used to substitute agricultural work for leisure, with men taking most advantage of the opportunities granted by higher income levels.

Age of the head of the households is positively associated with labor effort in agriculture, at a decreasing rate: older household members are more likely to work longer hours in agriculture, regardless of gender. Another interesting, although not surprising, result relates to the education variable: more educated households tend to work less in agriculture. Presumably, more educated individuals are more likely to find better off-farm opportunities. Also, not surprisingly, individuals in large households tend to work less hours, again with a higher impact on male labor.

As expected, households with more land and livestock resources, allocate more time to agriculture, both in total and per capita terms. Similar patterns are observed across gender lines, with the exception of the livestock variable, for which a stronger positive relation seems to exist between livestock ownership and male labor *vis a vis* female work. As per

[6] As we end up using the same IV specification for all models, in Table 5 we only report one full first stage regression, where the first three variables are the excluded regressors.

hypothesis, the crime level in the community appears to deter work in agriculture. Finally, holding everything else constant, households from the Mountain region work significantly less than their counterparts in the other regions. This result is somewhat counterintuitive, in view of the more limited off-farm job opportunities available to individuals in these poorer, more remote areas of the countries. However, it may also reflect differences in crop portfolios, with farmers in the remote North allocating more land to traditional, less labor-intensive staple crops. Finally, males in female-headed households work significantly less hours in agriculture, both in total and in per capita terms, possibly reflecting a different demographic composition of this group of households.

In Table 3 we report the results of the model seeking to explain expenditure on non-labor inputs in both agriculture and livestock production. Contrary to our initial hypothesis, migration also appears to have had a negative effect on the household's investments in productivity-enhancing and time-saving technologies in agriculture. Despite the overall low levels of investments in these inputs, migrant households appear to spend comparatively even less than their non-migrant counterparts. The finding is quite troublesome, as is indicative of a generalized divestment in agriculture as a result of migration. Farm households in Albania do not appear to be substituting equipment for labor or spending more in productivity-enhancing technologies; instead, they are using migration, and the remittances it generates, to move out of crop production. Finally, in line with earlier findings (McCarthy et al, 2006), migrant households appear to put instead more resources into livestock, again supporting the view that remittances from migration are fueling a shift away from crop production and into livestock.

Not surprisingly, larger farmers spend more on chemical inputs and equipment rental, while households with more livestock spend on average more on this type of production. At equal land size, having more plots is also associated with higher livestock production. Also, older farmers report higher expenditures in both chemical inputs and equipment rental, but decreasing at the margin, while larger households report spending less on equipment rentals and more on animal production.

In line with the finding that migration have a negative effect on the household's level of investment in productivity-enhancing and time-saving technologies in agriculture, we also find that migration has no significant impact on farm's technical

efficiency, thus, reinforcing the idea that migration is not being used to improve agricultural productivity (Table 5).

We finally turn to the income estimation (Table 4). In spite of reduced labor efforts in agriculture among migrant households, no significant differences are detected across the two groups of households in the levels of agricultural income. However, a strong, positive effect is found between migration and total income. As already put forth in McCarthy et al (2006), the results may be suggestive of recipient households investing the proceedings of migration in more remunerative activities other than crop production. Alternatively, the observed income increases could also be the result of a steady stream of remittances.

VII. Conclusions

The drastic transformation of the agricultural sector and massive demographic changes due to migration are without doubt two of the more salient phenomena of the post-communist period, and certainly the ones impacting Albanian rural farm households the most. However, despite its policy relevance, the nexus between these two trends has been largely ignored in the literature, as well as in policy making.

Taking advantage of new data on a high migration country, the main goal of this paper has been that of investigating the impact of migration on farm's technical efficiency, resource allocation to, and income from, agricultural production of farm households. The main channels through which these impacts can be expected to materialize are via the allocation of labor and capital resources of the households, as modified by the loss of 'resident' family workforce to migration and the gain in access to working capital or credit made possible by the inflow of remittances or simply by an improved economic and financial status of the household associated with migration.

Our results suggest that migration of one or more household members is being used by rural households in Albania as part of a strategy to move out of agriculture. The impact of family labor is unequivocal: members of households with migrants abroad work significantly fewer hours in agricultural production, both in total and on a per capita basis. However, although the direction of the impact holds for both male and female members, the magnitude of the impact differs across gender lines. Women in migrant

households work proportionately more than men, when compared with their counterparts in non-migrant households.

Contrary to expectation, and despite sizable remittances, migration has no impact on farm's technical efficiency and migrant households actually appear to invest less in productivity-enhancing and time-saving farm technologies in crop production such as chemical fertilizers and farm equipment. Instead, migrant households are shifting their on farm investment from crop to livestock production. These findings, together with the reduction in work effort in agriculture, particularly by males, can be interpreted as evidence of divestment behavior by migrant households out of agriculture and into livestock. Despite the reduced labor effort, however, agriculture income does not seem to decline as a result of migration, and total income (as expected) increases significantly. The latter result may be due to the direct effect of remittances, but also to increased income from other sources – something we do not investigate in this paper.

While from a development perspective, it may be reasonable for policy-makers to put a considerable amount of faith in the mending power of remittances to revive sluggish sectors of the economy, such as agriculture, the fact the rural households are not investing migrants' resources or their time into crop production is indicative of the fact that agriculture continues to give little prospects for growth and individual betterment for rural Albanians. Beyond the direct income effect derived from remittances, migration can also set off other types of transformations in the rural economy. For instance, assuming that technical efficiency goes up at lower levels of land fragmentation, divestment in agriculture, including land sales and rentals, by migrant households may ultimately foster a process of consolidation in favor of more capable farmers and a more efficient sector conducive of higher investments. Whether the rapid demographic changes in rural areas triggered by massive migration, possibly combined with favorable land and rural development policies, will ultimately produce the conditions for a more viable, high-return agriculture in which to invest more aggressively remains to be seen.

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Table 1. Migrant Households vs. Non-Migrant Households					
		Total	**Migrant**	**Non-Migrant**	**P-Value**
Dependent Variables	Agriculture labor (hours/year)	3098.35	2916.21	3199.91	**0.08**
	Per Capita Agriculture labor (hours/year)	954.36	946.65	958.66	0.81
	Male Labor in Agriculture (hours/year)	1581.26	1394.92	1684.86	**0.01**
	Per Capita Male Labor in Agriculture (hours/year)	960.30	927.51	978.53	0.44
	Female Labor in Agriculture (hours/year)	1535.59	1521.29	1506.03	0.87
	Per Capita Female Labor in Agriculture (hours/year)	935.38	910.46	949.24	0.47
	Agricultural Income	51,816	51,591	51,942	0.91
	Total Income (leks)	370,483	391,668	358,685	**0.04**
	Amount Spent on Equipment Rental (leks)	12,892	15,474	11,427	**0.00**
	Amount Spent on Chemical Inputs (leks)	11,226	135,21	9,973	**0.01**
	Amount Spent on Livestock Expenditure (leks)	10,669	10,400	10,821	0.76
	Percent of HH that Spent on Equipment Rental	70.8	71.6	70.3	0.64
	Percent of HH that Spent on Chemical Inputs	89.8	88.7	90.5	0.32
	Percent of HH that Spent on Livestock Expenditure	69.6	70.0	69.4	0.83
	Technical Efficiency	0.29	0.29	0.28	0.54
Household Characteristics	Number of Individuals in the HH Currently Migrating	0.67	1.8684	0	**0.00**
	Land Area (Square Meters)	9485.5	11762.2	8216.1	**0.00**
	Number of Plots Owned by the Household	3.44	3.6	3.3	**0.00**
	Female Headed Households (Dummy=1 if the Head is Female)	6.76%	10.38%	4.75%	**0.00**
	Highest Level of Education in the Household	9.79	9.266235	10.07436	**0.00**
Community Characteristics	Coastal (Dummy=1 if HH lives in Coastal Region)	33.05%	45.00%	26.39%	**0.00**
	Central	52.64%	44.99%	56.91%	**0.00**
	Mountain	14.31%	10.02%	16.70%	**0.00**
	Distance Index (Proximity to Public Facilities)	0.29	0.20	0.34	**0.07**
	Count of Different Types of Crimes in the Community	0.49	0.49	0.49	0.95
	Land Disputes (Dummy=1 if HH has Disputes over Land)	63.75%	68.36%	61.17%	**0.01**
Instrumental Variables	Anyone in the Household Spoke Italian or Greek in 1990	10.12%	13.78%	8.08%	**0.01**
	Minimum Distance From Border Crossings	114.92	120.03	112.09	**0.02**
	Percentage of Males Ages 20-39 in the Municipality	14.14	13.72629	14.37147	**0.00**
Total Observations		1559	521	1,038	

Table 2. Agricultural Labor

	Household Labor in Agriculture		Male Family Labor in Agriculture		Female Family Labor in Agriculture	
Regressors	Total	Per capita	Total	Per capita	Total	Per capita
Number of permanent migrants abroad	-5173.24*	-1512.90*	-4747.85*	-2665.36*	-2234.36*	-1341.581*
	(1159.90)	(348.34)	(1132.27)	(653.60)	(618.27)	(366.75)
Human Capital						
Female Headed Household (Dummy=1)	-948.35	-244.42	-1967.77*	-1063.52*	94.26	-192.46
	(660.28)	(198.87)	(634.89)	(374.44)	(359.75)	(204.54)
Household Size	-222.68	-200.13*	-377.96*	-325.06*	25.81	-148.23*
	(173.27)	(51.99)	(165.73)	(96.53)	(94.35)	(55.07)
Age of Head of Household	832.10*	200.23*	709.80*	355.02*	375.35*	181.60*
	(153.26)	(45.46)	(147.27)	(84.21)	(83.10)	(48.65)
Age Head Squared	-6.67*	-1.65*	-5.53*	-2.83*	-3.12*	-1.60*
	(1.21)	(0.36)	(1.15)	(0.66)	(0.66)	(0.38)
Highest Year of Education in the Household	-261.36*	-78.21*	-211.56*	-130.63*	-130.48*	-65.62*
	(67.79)	(20.14)	(62.18)	(36.04)	(35.54)	(21.09)
Natural/Physical Capital						
Land Area (sqm)	0.11*	0.03*	0.10*	0.05*	0.04*	0.02*
	(0.03)	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)
Total Household Plots	408.39*	118.96*	274.77*	157.08*	252.60*	144.61*
	(115.35)	(33.37)	(99.32)	(57.60)	(65.82)	(37.52)
Total Animals Owned (TLU)	348.48*	86.47*	256.52*	116.69*	127.69*	71.86*
	(120.12)	(33.58)	(94.35)	(53.63)	(79.34)	(44.71)
Community and Regional Characteristics						
Community Disputes Over Land (dummy)	62.44	54.79	-236.50	-132.94	336.91*	244.93*
	(315.69)	(94.67)	(286.92)	(168.23)	(174.11)	(102.75)
Distance Index (Distance to Public Services)	86.49	36.60	57.39	39.31	35.33	41.78
	(118.34)	(35.28)	(106.85)	(61.00)	(64.78)	(37.66)
Crime in the Community	-882.95*	-217.74*	-571.17*	-308.17*	-578.73*	-251.48*
	(250.45)	(73.90)	(231.20)	(134.76)	(140.95)	(82.92)
Coastal (Dummy=1)	-99.37	10.53	342.69	363.81	-311.28	-219.07
	(502.94)	(149.88)	(463.55)	(271.44)	(271.73)	(160.33)
Mountain (Dummy=1)	-1123.39*	-301.45*	-606.91*	-297.22	-883.66*	-531.96*
	(387.76)	(112.91)	(353.18)	(205.45)	(213.35)	(122.40)
Constant	-16613.06*	-2827.38*	-14958.44*	-6268.82*	-8075.33*	-2808.09*

	(3186.17)	(936.13)	(3034)	(1729.23)	(1750.09)	(1015.52)
Total Observations	1526	1526	1526	1526	1526	1526
Censored Observations	354	354	645	645	588	588
Wald Test of Exogeneity, P-Value				0.00		
Durbin-Wu-Hausman, P-Value				0.00		
Cragg-Donald (F-Stat)				11.12		
Prob > F				0.00		
Hansen J Statistic P-Value	0.21	0.27	0.18	0.22	0.27	0.29

Note: Robust Standard Errors Reported in Parenthesis

* Indicates significance at 10% level or lower.

Table 3. Agricultural Expenditure (Ln Leks)

Regressors	Chemical Inputs	Equipment Rental	Livestock exp.
Number of Individuals Abroad	-4.65*	-7.18*	3.33*
	(1.28)	(2.06)	(1.64)
Human Capital			
Female Headed Household (Dummy=1)	-0.67	-1.51	-0.36
	(0.71)	(1.13)	(0.89)
Household Size	-0.33*	-0.79*	0.76*
	(0.19)	(0.31)	(0.24)
Age of Head of Household	0.66*	1.07*	-0.06
	(0.17)	(0.28)	(0.22)
Age Head Squared	-0.0053*	-0.008*	-0.0003
	(0.0013)	(0.002)	(0.001)
Highest Year of Education in the Household	-0.09	-0.20*	0.03
	(0.07)	(0.11)	(0.08)
Natural/Physical Capital			
Land Area (sqm)	0.00010*	0.0002*	0.00001
	(0.00004)	(0.00008)	(0.00003)
Total Household Plots	0.62*	0.93*	0.30*
	(0.11)	(0.21)	(0.12)
Total Animals Owned (TLU)	0.08	-0.13	1.40*
	(0.13)	(0.21)	(0.18)
Community and Regional Characteristics			
Community Disputes Over Land (Dummy=1)	1.57*	2.40*	0.11
	(0.33)	(0.58)	(0.43)
Distance Index (Distance to Public Services)	0.009	-0.69*	0.16
	(0.11)	(0.22)	(0.15)
Number of Crimes in the Community	-0.42*	-1.50*	0.18
	(0.25)	(0.45)	(0.35)
Coastal (Dummy=1)	0.54	0.89	-0.40
	(0.50)	(0.89)	(0.61)
Mountain (Dummy=1)	-0.71*	-3.03*	0.40
	(0.39)	(.73)	(0.52)
	-7.86*	-19.62*	2.06
Constant	(3.52)	(5.96)	(4.74)
Total Observations	1526	1526	1526
Censored Observations	188	545	446
Wald Test of Exogeneity P-Value	0.00	0.00	0.05
Durbin-Wu-Hausman, P-Value		0.00	
Cragg-Donald (F-Stat)		11.2	
Prob > F		0.00	
Hansen J Statistic P-Value	0.46	0.83	0.096

Note: Robust Standard Errors Reported in Parenthesis
* Indicates significance at 10% level or lower.

Table 4. Income (Ln Leks)

Regressors	HH Agricultural Income	HH Total Income
Number of Individuals Abroad	0.70	1.31*
	(1.18)	(0.30)
Human Capital		
Female Headed Household (Dummy=1)	-0.30	-0.11
	(0.54)	(0.17)
Household Size	0.15	0.21*
	(0.17)	(0.05)
Age of Head of Household	-0.05	-0.09*
	(0.14)	(0.04)
Age Head Squared	0.00034	0.00063*
	(0.0011)	(0.0003)
Highest Year of Education in the Household	0.03	0.09*
	(0.05)	(0.02)
Natural/Physical Capital		
Land Area (sqm)	-0.00002	-0.000011*
	(0.00002)	(0.000005)
Total Household Plots	0.04	-0.0015
	(0.09)	(0.03)
Total Animals Owned (TLU)	0.21*	0.07*
	(0.08)	(0.03)
Community and Regional Characteristics		
Community Disputes Over Land (Dummy=1)	-0.23	-0.20*
	(0.29)	(0.09)
Distance Index (Distance to Public Services)	0.42*	0.02
	(0.10)	(0.03)
Number of Crimes in the Community	0.66*	0.22*
	(0.25)	(0.07)
Coastal (Dummy=1)	-0.36	-0.14
	(0.42)	(0.14)
Mountain (Dummy=1)	1.43*	0.07
	(0.34)	(0.11)
Constant	10.07*	15.00*
	(3.04)	(0.86)
Total Observations	1519	1519
Censored Observations	199	0
Wald Test of Exogeneity, P-Value	0.48	
Durbin-Wu-Hausman ,P-Value	0.2727	0.00
Cragg-Donald (F-Stat)	11.12	
Prob > F	0.00	
Hansen J Statistic P-Value	0.20	0.79

Table 5. Farm's Technical Efficiency[7]

Regressors	Technical efficiency
Number of Individuals Abroad	.0252
	(.0319)
Human Capital	
Female Headed Household (Dummy=1)	-.085*
	(.0218)
Household Size	.00542
	(.00548)
Age of Head of Household	.00474
	(.0048)
Age Head Squared	-.000038
	(.000039)
Highest Year of Education in the Household	.000044
	(.00223)
Community and Regional Characteristics	
Community Disputes Over Land (Dummy=1)	-.00664
	(.0124)
Distance Index (Distance to Public Services)	.02025*
	(.00493)
Number of Crimes in the Community	.00523
	(.01001)
Coastal (Dummy=1)	.01648
	(.01694)
Mountain (Dummy=1)	-.00722
	(.01495)
Constant	.12016
	(.10912)
Total Observations	1514
Durbin-Wu-Hausman ,P-Value	0.24
Cragg-Donald (F-Stat)	31.61
Prob > F	0.00
Hansen J Statistic P-Value	0.58

[7] The language variables italian90 and greek90 were used in this regression.

Table 6. First Stage Regression

Regressors	Number of Migrants
Proportion of Males, Age 20-39	-0.02
	(0.02)
Language90	0.27*
	(0.11)
Minimum Distance (km) from Southern Cross Point	0.002*
	(0.001)
Human Capital	
Female Headed Household (Dummy=1)	-0.04
	(0.12)
Household Size	-0.14*
	(0.01)
Age of Head of Household	0.11*
	(0.01)
Age Head Squared	-0.001*
	(0.0001)
Highest Year of Education in the Household	-0.03*
	(0.01)
Natural/Physical Capital	
Land Area (sqm)	0.0000109*
	(0.000004)
Total Household Plots	0.03
	(0.02)
Total Animals Owned (TLU)	-0.03*
	(0.01)
Community and Regional Characteristics	
Community Disputes Over Land (Dummy=1)	0.07
	(0.05)
Distance Index (Distance to Public Services)	-0.02
	(0.02)
Number of Crimes in the Community	-0.05
	(0.04)
Coastal (Dummy=1)	0.13
	(0.08)
Mountain (Dummy=1)	-0.05
	(0.06)
Total Observations	1526

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