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CONTINENTAL VS. INTERCONTINENTAL MIGRATION: AN EMPIRICAL ANALYSIS OF THE IMPACT OF IMMIGRATION REFORMS ON BURKINA FASO

by

Fleur Wouterse

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PREFACE

While the impact of migration policies is generally observed from the point-of-view of the host country, using indicators such as wages, employment and taxation, immigration policies have seldom taken into account the externalities they produce on the home country. Only recently has there been considerable development in the literature on the impact on household welfare, such as poverty, investment and labour supply.

This paper by Fleur Wouterse sheds light on the topic by looking at the impact of potential changes to European immigration policies on rural household welfare in Burkina Faso. Simulated changes in the cost of migration and in the change of migration status in the host country provide evidence that immigration policy impacts the welfare of the home-country household. While household labour supply generally increases when a member emigrates, remittances help reduce the pressure to replace foregone labour. Moreover, the impact of South-South migration (from Burkina Faso to Côte d’Ivoire) on labour supply and also on welfare for the household is smaller than in the South-North context (from Burkina Faso to Europe).

The paper is part of the “Effective Partnerships for Better Migration Management and Development” project, financially supported by the John D. and Catherine T. MacArthur Foundation. Since June of 2008, the project aims at carrying-out an in-depth assessment of the migration-development relationship in Central America and West Africa in two critical policy domains: the governance of international migration at the global, regional, national and local levels; and the link between migration and labour markets in developing countries.

Mario Pezzini
Director
OECD Development Centre
May 2011
RÉSUMÉ

Ce document de travail repose sur un modèle décrivant des ménages agricoles pour étudier l’impact de réformes potentielles des politiques migratoires sur le bien-être en zone rurale au Burkina Faso. Les résultats des simulations démontrent qu’à la différence des migrations continentales, l’effet des migrations intercontinentales est plus important sur le bien-être du ménage. De même, une durée plus longue de séjour à l’étranger des migrants intercontinentaux a un impact positif sur le bien-être. Les résultats constituent un argument en faveur de la mise en place d’un programme de migrations temporaires (PMT) qui en abaissant le coût des migrations intercontinentales permettrait aux ménages les plus pauvres de recourir aux migrations intercontinentales. La nature temporaire d’un tel programme permet d’atténuer les effets liés au « syndrome hollandais » de par un retour éventuel des migrants. Accorder un statut légal aux migrants qui sont déjà à l’étranger avec un permis de travail temporaire et un permis de résidence est aussi recommandé si l’objectif est d’améliorer le bien-être des ménages de migrants. La légalisation peut être accordée selon le même PMT afin d’encourager le retour éventuel des migrants.

Classification JEL: J08, J61, F22, O55
Mots-clés: migrations, offre de travail, transferts d’argent, politiques d’immigration, Burkina-Faso

ABSTRACT

This working paper uses an agricultural household model to explore the impact of potential immigration policy reforms on the welfare of rural households in Burkina Faso. Simulation results demonstrate that, in contrast to continental migration, increased intercontinental migration has strong positive household welfare effects. Similarly, an increase in the stay abroad of intercontinental migrants impacts positively on welfare. Findings lend support to the introduction of a Temporary Migration Programme (TMP) which, by lowering the cost involved, would enable poorer households to engage in intercontinental migration. The temporary nature of such a program ensures that “Dutch disease” effects are mitigated through eventual migrant return. Granting of legal status to migrants already abroad through a temporary work and residence permit is also recommended if the objective is to improve the welfare of migrant-sending households. Legalisation can be granted under the same TMP so that the eventual return of migrants would be encouraged.

JEL-Classification: J08, J61, F22, O55
Keywords: migration, labour supply, remittances, immigration policy, Burkina Faso
I. INTRODUCTION

The African continent has a long history of migratory movement and labour is still particularly mobile in this part of the world. In Burkina Faso, continental migration has long taken place in response to drought and low agricultural productivity and was institutionally induced during colonial times when labour was needed in mines and on plantations mainly in coastal countries such as Côte d’Ivoire. Intercontinental migration, to Western Europe in particular, has become more important over the last decades for Burkinabé migrants (Adepoju, 1977; Arthur, 1991; Findley, 1997; Yusuf, 2003). Intercontinental migration generally generates a high level of remittances but high entry costs often imply that not all households can engage in this form of migration.

Two contrasting views exist concerning the relationship between migration and the development of migrant-sending economies. On the one extreme, there is the optimistic perspective associated with the New Economics of Labour Migration (NELM) according to which migration and remittances as part of a household strategy to raise income, investment funds and insurance protection, can promote the development of sending economies by loosening production and investment constraints. A more pessimistic approach to consequences for development draws on findings that remittances are not used for productive investment and emphasises the “Dutch disease” effect according to which the extra income, combined with the reduction in labour force, leads to higher prices for non-tradables and discourages the production of tradable goods (Connell et al., 1976; David, 1995; de Haan, 1999).

With the slowdown in economic growth and considerable unemployment in Europe, African migrants are increasingly perceived as a burden and even a threat to economic growth and the welfare state (de Haas, 2006). Despite increasingly restrictive immigration policies, intercontinental migration from West-Africa to Europe has been surprisingly persistent over the past decades and has even witnessed an increase since the 1990s. Following the failure of policies to meet their stated objectives in terms of curtailing migration or inciting return migration (Castles, 2006), it has been emphasised that human mobility is an inherent, and desirable, component of the development process of migrant-sending economies and that circular migration can be promoted as a policy measure to enhance the contribution of migrants to the development of destination countries (Adepoju, 2007).

This paper explores the impact of potential migration policy reforms in Europe on the welfare of rural households in Burkina Faso. An agricultural household model is used to capture the impact of potential policy reforms on migration, production and consumption of households, culminating in welfare effects in terms of changes in household utility. The model is estimated using household farm survey data from the Central Plateau of Burkina Faso collected by the author in 2002.
II. MIGRATION AND DEVELOPMENT IN MIGRANT-SENDING ECONOMIES

II.1. Impact of migration on the local economy

A benchmark that is useful for analysing the impact of migration on development is how migration and related remittances reshape migrant-sending economies. Three cornerstones of policy that “maximise migration payoffs” have been identified by Martin and Straubhaar (2001), namely remittances, recruitment and return. According to the New Economics of Labour Migration (NELM) pioneered by Stark (1991), remittances could stimulate the local economy by enabling households to overcome production and investment constraints. Tests have appeared in the literature confirming this theory. Taylor et al. (2003), for example, find for rural China that remittances stimulate crop production. Lucas (1987) finds for a number of countries in southern Africa that remittances enhance both crop productivity and cattle accumulation in the long run. Lambert provides evidence from Côte d’Ivoire of migration as a risk-sharing mechanism (1994). Wouterse and Taylor (2008) find for Burkina Faso that intercontinental migration plays an important role in household income diversification into livestock production suggesting that remittances enable households to overcome entry barriers to high-return activities resulting from missing or imperfect credit markets. However, pessimism concerning development impacts of migration on the sending areas has been fuelled by findings that remittances are not used for productive investments (Connell et al., 1976; David, 1995; de Haan, 1999).

Recruitment deals with the question of who migrates. Migration implies a loss of labour to the sending economy and migration “pessimists” often emphasise the “Dutch disease” effect according to which the extra income in the form of remittances, combined with the reduction in labour force, leads to higher prices for non-tradables and discourages the production of tradable goods. Wouterse and Taylor (2008) demonstrate for Burkina Faso that in the context of a missing or imperfect labour market and household labour constraints, a trade-off exists between long-term, intercontinental migration and engagement in relatively labour-intensive activities at home with the former crowding out the latter. Reichert (1981) in his article on Mexican migration to the United States identifies a phenomenon termed “the migrant syndrome” according to which an increased standard of living in the migrant-sending economy can only be maintained through recurrent migration. If migrants are positively selected with respect to human capital characteristics, migration may cause a "brain drain" from the rural economy, the effects of which are similar to those of capital flight, lowering the productivity level, and hence wages, of complementary labour in migrant-sending areas (Taylor and Martin, 2001). Traditional arguments about the brain drain have more recently been joined by claims of brain gain processes. Boucher et al. (2005), for example, provide evidence from Mexico that the returns to –
and the continued possibility of – internal migration create incentives for investment in schooling which, in turn, reverses the static, human-capital depleting effect of internal migration.

*Returns* refers to the issues of migrant return with new technologies and ideas of use both to them and to their country, or of return to retire. Migrants display a certain risk-taking behaviour, which when combined with skills and capital acquired elsewhere – brain gain – can positively impact on economic development in the source economy. Zhao (2002) demonstrates for China that return migrants invest significantly more in productive farm assets suggesting that return migrants could play an important role in the modernisation of agriculture. For Egypt, McCormick and Wahba (2003) show that migrants returning from an international destination are more likely to invest in an enterprise. As demonstrated in the discussion above, each of these channels remains controversial: whether remittances permit expansion or cause contraction of domestic production at home remains disputed, while return migration poses problems of reassimilation, particularly when large-scale return is unanticipated. The three elements are also intimately interconnected (Lucas, 2005).

**II.2. Policy environment**

Maximisation of the impact of migration on development depends on the implementation of sound macroeconomic policies in the sending as well as receiving economies. In the survey villages, almost all (about 90%) of intercontinental migration takes place to Italy whereas continental migration has overwhelmingly been directed to Côte d’Ivoire. Côte d’Ivoire has long lacked a migration policy implying that migrants struggled to obtain an official status. Rights of migrants were severely compromised by the acceptance of a new law in 1998 prohibiting non-Ivoirians to own land, denying all former rights that migrants had held in Cote d’Ivoire since its independence. This policy change in Côte d’Ivoire appears to have negatively affected recruitment of Burkinabe migrants as well as remittances and to have stimulated the return of migrants to Burkina Faso.

Italy’s immigration picture changed significantly under Berlusconi’s rule. In 2002, the government passed legislation to regulate immigration and adopted a decree to provide for the regularisation of undocumented immigrants already in the country. In contrast, the new law tightened the link between the work contract and residence permit by bringing them together under one single *contratto di soggiorno-lavoro* (residence-employment contract). The residence permit for work was made dependent on a combined residence and employment contract. The permit was valid only for the same duration as the employment contract and for no more than nine months for seasonal workers, for no more than one year for temporary workers, and for no more than two years for non-temporary workers. Finally, the government modified the 1998 law by requiring immigrants to have job contracts before entering Italy. By pursuing this twin-track approach, the Italian government hoped to demonstrate to illegal immigrants that it was not

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1 Burkina Faso is estimated to count more than 1 million emigrants for a population of 11 million, or an emigrant stock of almost 10%. 90% of these migrants have left for another African country, while migration to Europe constitutes 1.3% of all emigration, or about 10 000 migrants in absolute numbers. For Burkinabé migrants in Europe, France is the first and Italy the second most important destination (De Haas, 2008).
worth taking the risk; and it wanted to make deals with governments of the countries from which they set out. However, so far it appears that immigrants planning to enter illegally were not deterred by these new laws (Al-Azar, 2010).

Italian migration policy needs to be placed in the broader context of policy reforms that are taking place in the European Union. Since the 1970s, the principal response of European governments has been to try to control migration from low-income countries through the imposition of increasingly restrictive immigration laws and regulations, intensified border controls, carrier sanctions, deterrent policies and return migration policies. However, these policies have not only generally been unsuccessful in reaching their objectives, but have also had substantial counterproductive effects by interrupting circular migration patterns and pushing people into permanent relocation to the receiving economy (De Haas, 2006). The West-European experience with “guest workers” from Mediterranean countries presents a clear example in this respect. Confronted with the inability to control migration by legal and repressive means, development aid has been put forward as a means to limit future immigration (De Haas, 2006). The EU has increasingly emphasised the importance of linking migration and development policies through integrating migration (control) issues in its relation with migrant-sending countries. Promoting development in sending countries could be an effective means to reduce immigration if migration and development are negatively and linearly correlated processes and, hence, substitutes. However, so far there is no evidence that aid and trade policies have any significant effect on reducing people’s propensity to migrate (De Haas, 2006).

In recent years there has been a renewed interest in “temporary” migration as a possible solution to migration dilemmas (Castles, 2006). Various bodies such as the European Commission, the Global Commission on International Migration and the World Bank have suggested the stimulation of temporary migration, in particular of the low skilled, as a strategy to reconcile the interests of the migrants, sending and destination countries (De Haas, 2006). Despite drawbacks experienced with past schemes, proponents of new Temporary Migration Programmes (TMPs) argue that innovative policy designs could help avoid policy mistakes characterising the guest worker programmes of the past and generate significant benefits for all sides involved, including migrant workers and their countries of origin. Temporary migration could create a ‘win-win-win’ situation according to which migrants, as well as migrant-sending and receiving economies would benefit: sending countries are thought to benefit from the return of their migrants, whose financial and human resources could contribute to development. TMPs can help host countries to manage the demand for migrant labour, help migrants to gain better legal access to the labour markets of high-income countries and help sending countries in their efforts to maximise the developmental benefits from emigration. Temporary or seasonal migrant

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2 “Guest workers” were considered as temporary migrants and governments of receiving countries experimented with measures to discourage family reunification and to encourage and prepare migrants to return to their home countries. However, these return policies did not lead to a substantial increase in return migration for a number of reasons: first, there was a perceived lack of opportunities for economic reintegration in countries of origin; second, and more relevant for the current discussion, increasingly restrictive (re)admission policies made migrants decide to stay in the host country to avoid being refused readmission (de Haas, 2006).
worker programs have already been introduced in a number of countries, including Germany, Netherlands, Norway, Ireland, Belgium, Sweden, Greece, Italy, Spain and the UK. In addition, some Southern European countries have used large-scale legalisation programmes to turn undocumented workers into regular members of their labour forces. Recently, a European Union-wide approach to the admission of migrant workers has been proposed (De Haas, 2006).

Circular migration has recently come to the forefront in migration management as an innovative option that could address intricate migration issues. It is important to distinguish circular migration from mere temporary or seasonal migration. Return and temporary migration are both circular, in that migrants go back to their places of origin — but, in both, repatriation was conceived as the end-point at which mobility ceased. Circular migration is a more dynamic concept; in fact, circular migration implies repetitive or repeat migration, which is not necessarily temporary or seasonal. A circular migration scheme is thought to have the added advantage of tapping into the natural preferences of many migrants to return at least temporarily to their place of origin. Circular migration is thought to build in the dynamism of a continuing engagement in both countries (Newland, 2009). However, TMPs that are designed around more flexible and open working arrangements could themselves encourage circular migration without imposing it. It is also possible that the developmental impact of returning migrants who accumulated savings as well as human capital over a much longer stay abroad would be larger.

II.3. Analysis of impact of migration policies on the welfare of migrant-sending countries

Economic theory can provide guidance on the conceptualisation and design of migration policy reforms. To support the policy debate, various mechanisms analysed by theory need to be quantified. When quantifying models, several approaches can be followed. One approach consists in gathering empirical information from previous studies and, on that basis, making a best guess about the likely value of model parameters. These parameters are scaled to satisfy all the constraints imposed by theory (Sadoulet and De Janvry, 1995). A second approach which, though more desirable, is more time consuming and data intensive involves the estimation of all the relations implicated in the model; the latter is the approach taken here.

Microeconomic studies focus on the behaviour of rural households directly affected by policy and market shocks. Rural economies are composed of households with diverse production activities, technologies and demand patterns. Typically, in less developed countries (LDCs), these households interact in imperfect market environments. When economic actors are affected directly by policy changes, these changes can be captured by agricultural household models. However, high transaction costs in product and factor markets may isolate some households from outside markets, limiting or blocking the transmission of policy influences. This is one motivation for recent studies of modelling agricultural household economies with endogenous shadow prices for household non-tradables (e.g. De Janvry, Fafchamps and Sadoulet, 1991; Strauss, 1986) and is the approach taken in this study. The analysis of impacts of policy shocks in rural economies is complex. Indirect effects result from economic interactions that transmit the impacts of policy reforms inside and outside of the rural economy via markets for factors and commodities. Micro models offer insights into the behaviour of households that are directly affected by policy shocks; however, they miss interactions among households.
III. AN AGRICULTURAL HOUSEHOLD MODEL

III.1. Model structure

The agricultural household model used for estimation is summarised in Appendix I and described below. Household farms are assumed to maximise a Stone-Geary utility function (Stone, 1954) defined on consumption goods and home time.³ In the absence of a labour market, allocation of household labour to the different activities is subject to a time constraint. Households are limited in their consumption by a budget constraint, since they cannot spend more than they earn. Household full income is comprised of income from agricultural and other activities including migration as well as a valuation of household time at the shadow wage. On the production side, the technology in agriculture is defined as Cobb-Douglas. Agricultural production is carried out with labour, other tradable inputs, land and capital. Physical capital and land inputs are fixed in the short run. The production technology for non-farm activities is also defined as Cobb-Douglas. However, production of non-farm output is carried out with labour and human capital variables. Remittances are produced by allocating household time to continental or intercontinental migration; time allocated to continental or intercontinental migration is a function of household assets, such as landholdings, as well as networks. Policies related to migration are taken as exogenous and their multiple implications for production, consumption, the shadow wage and household welfare are traced out by simulation.

III.2. Data

Data to estimate the agricultural household model are from a household survey conducted by the author in four villages in Burkina Faso, Niaogho and Béguédo in the south and Boussouma and Korsimoro in the north, in February-March 2003. This survey provides detailed cross-section data on assets, socio-demographic characteristics, production, income sources including migration, and consumption of 223 rural households in four villages on the Central Plateau, which constitutes the central region of Burkina Faso. Agriculture is the primary activity of the surveyed households. Cropping is characterised by one short, single cropping season per year. Labour productivity tends to be low; rainfall is limited, there is a lack of irrigation and soils

³ Other functional forms such as the Almost Ideal Demand System (AIDS) or the Generalized Ideal Demand System (GAIDS) are often preferred due to their more flexible forms and the possibility to use linear estimation techniques. However, both AIDS and GAIDS require the use of prices, information on which is not available from the survey.

⁴ Home time (in days) includes leisure but also activities such as food processing, firewood and water collection, and childcare.
are generally poor (Kessler and Geerling, 1994). Households diversify their income by engaging in livestock production, non-farm activities and migration. Livestock in Burkina Faso tends to be kept for multiple purposes and households derive income mainly through embodied production: an increase in weight or herd size. Many households also derive income from a number of non-farm activities. These tend to be self-employment activities and are generally intensive in labour but not capital.

In all four villages household members were found to engage in migration; around 64% of surveyed households had one or more migrants during 2002. Two main forms of migration can be distinguished: continental migration and intercontinental migration. The primary destination of continental migrants until recently was Côte d’Ivoire. However, the migrant flow to Côte d’Ivoire has all but vanished due to the unstable political situation, ethnic tensions and anti-foreigner sentiment there. Many Burkinabé now migrate to the capital of their country, Ouagadougou. Intercontinental migration comprises young (Bissa) males who go to Italy, initially to engage in horticulture around Naples. It is highly lucrative in terms of remittances sent back to the household; however, it involves high entry costs. Continental migration is less costly but generates comparatively few remittances. Household physical capital plays an important role in intercontinental migration as most households were found to have sold off liquid assets to finance migration to Italy. In addition to the important role played by physical capital in determining intercontinental migration, social capital in terms of access to a network also appears to be important.

Household income sources by migration status are given in Table 1.

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5 Bissa or Bisa is an ethnic group living in South-Central Burkina Faso.
6 Intercontinental migration to Italy started in the early 1980s when a Bissa from Béguedo working in Côte d’Ivoire was invited by his employer, an Italian, to work for him as a driver around Rome. Migration to Italy by males from Nioagho and Béguedo subsequently gained momentum through a network of information. Although initially engaged in horticulture, most of the surveyed migrants now work as low-skilled labourers in industry in northern Italy, primarily around Bergamo and Brescia. These migrants have tended to leave the country alone but may send for their wives and children to come over at a later stage. Most migrants were found to have travelled by plane, which implies high entry costs particularly in the form of transport to the destination.
7 The cost of obtaining information, payment to intermediaries to cross the border, if migration is illegal, transport costs and direct survival costs upon arrival.
Continental vs. intercontinental migration: an empirical analysis of the impact of immigration reforms on Burkina Faso

Table 1. Rural household income and composition by household group

<table>
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<tr>
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<th>Non-migrant (N=78)</th>
<th>Continental migrant (N=112)</th>
<th>Intercontinental migrant (N=32)</th>
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</thead>
<tbody>
<tr>
<td>Total income</td>
<td>454 260 (416 619)</td>
<td>541 271 (341 872)</td>
<td>1 173 606 (642 451)</td>
</tr>
<tr>
<td>Staple cropping</td>
<td>0.59</td>
<td>0.51</td>
<td>0.21</td>
</tr>
<tr>
<td>Cash cropping</td>
<td>0.12</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Livestock</td>
<td>0.11</td>
<td>0.11</td>
<td>0.14</td>
</tr>
<tr>
<td>Non-farm</td>
<td>0.17</td>
<td>0.17</td>
<td>0.09</td>
</tr>
<tr>
<td>Remittances (continental)</td>
<td>-</td>
<td>0.19</td>
<td>-</td>
</tr>
<tr>
<td>Remittances (intercontinental)</td>
<td>-</td>
<td>-</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Notes: a standard deviation in parentheses. b 168 FCFA=USD 1 (PPP 2002) (World Bank, 2005)

Source: Author’s calculations.

Use of hired labour in agriculture is uncommon in the survey villages. A missing market for labour is characteristic of rural areas lacking a large landless class and with high homogeneity in factor endowments (De Janvry, Fafchamps and Sadoulet, 1991). In the survey villages, no commercial land market transactions were found to take place, suggesting a missing market for land. On the Central Plateau, high population density has led to land scarcity and cultivation on the basis of hereditary possession is most common (Kessler and Geerling, 1994). In rural Africa land markets often barely function and are generally quite thin (Lanjouw, Quizon and Sparrow, 2001). The lack of commercial land market transactions implies that land cannot function as collateral for credit. Limited collateral and collateral substitutes severely limit rural households’ access to formal credit in West Africa (Binswanger, McIntire and Udry, 1989; Binswanger and Rosenzweig, 1986; Fafchamps, Udry and Czukas, 1998; Reardon, Delgado and Matlon, 1992).

III.3. Model estimation

Households are assumed to be price takers in all markets and maximise utility, subject to a budget and a time constraint. In case of a missing market for labour, the shadow wage is relevant in determining the household’s organisation of production and its choices of consumption. The parameters of the utility function are then estimated using a system of expenditure equations, with the shadow wage as a substitute for the market wage. In the estimation of the agricultural production function, labour and other tradable inputs are considered to be endogenous. Instruments used in the two-stage least squares estimation are the number of plots, a dummy for plough ownership, the number of active men and women in the household, the education level, age and number of wives of the head of household, and the dependency ratio. The shadow wage is derived from estimation results and is used to estimate the parameters of the welfare function. Because not all households engage in self-employment, a probit indicator function is estimated for participation in self-employment activities, the estimated coefficients from the probit regression are used to calculate the inverse Mills ratio, included in the self-employment production function. Labour is considered endogenous and instruments include household size, male-female ratio, return migrants and the dependency ratio.
To investigate the motives for the two different forms of migration, a multinomial logit model is first estimated. The identification of migration is particularly complex in the absence of longitudinal data and the approach taken here merits further discussion. Migration is an inter-temporal phenomenon and because in the current context it tends to be long-term, suitable determinants need to have remained unchanged over time. A missing market for land implies that household landholdings should not have changed over time. Land is considered as a determinant of the income generation ability of the household and thus an indicator of wealth at the time of migration. It is important to realise that, primarily due to polygamy, household size is often not stable over time. In Burkina Faso as in other parts of West-Africa, the majority of the rural population lives in complex household units. Often, households are either fraternal, where married brothers of the head of the household live in the same compound and work the household fields, or paternal in which married sons work on their father’s fields (Becker, 1990). Both household forms imply that sons tend to stay within the household whereas daughters move to the household of their husband. The number of adult sons, including migrants, can therefore serve as a proxy for household size at the time of migration. The access to a network of potential migrants and their households is also likely to explain migratory movement.\(^8\) It is likely that households that contain male members who have attended Koranic school as children have access to a network through contact with a marabout, facilitating migration by lowering its entry cost.

Following Hoddinott (1994), Mills ratios are derived from the multinomial logit for both forms of migration and included in an OLS estimation of remittances to account for the fact that migrants are a non-random selection of the population. Migrant destination, continental or intercontinental, is expected largely to explain remittances. However, how remittance flows develop over time is a strategically important question for migrants’ countries of origin. If money transfers diminish rapidly after migrants have settled abroad, continued migration is a prerequisite for sustaining the inflow of remittances. If remittances are transferred for a particular purpose, such as the repayment of education costs, one might expect them to decline with time (Lucas and Stark, 1985). The same is true for repayment of migration costs, which are more likely to be explicitly defined as a loan. Most importantly, however, demographic processes may lead to falling remittance flows. As time passes following the departure of a migrant, the number of potential remittance recipients is likely to be reduced through chain migration and death. The possible negative trend in remittances over time is known as “the remittance decay hypothesis”. Duration of absence of migrants is included in the regression to test this hypothesis.

The specification of the household welfare function and optimality conditions in equality yield a system of six expenditure equations for own agricultural produce, purchased food, non-

\(^8\) In rural Burkina Faso, common characteristics of networks tend to be religious more than geographic and the vast majority of boys are enrolled in Koranic school in which a master (“marabout”) teaches his method (“tariqah” which means “way” or “path”) to his disciple (“talibe”). The individual relationship between talibe and marabout has always been the basis of a wider network of solidarity. Certain marabouts and brotherhoods of marabouts have developed and exercised major political and economic power in the countries concerned. Muslim brotherhoods have also been recorded to give out loans to aspiring migrants and their households in Burkina Faso (Findley, 1996).
food items, consumer durables and other expenses, education and home time, with the shadow wage and full income as explanatory variables. Since one of the six error terms added to these equations is stochastically dependent due to the budget constraint, a Linear Expenditure System (LES) consisting of five equations is estimated. A missing market for labour implies that labour is a non-tradable; a thin food market implies limited tradability of staple output. Prices of commodities with no or limited tradability are likely to differ between geographical clusters (Deaton, 1986). A location dummy is used as a shift factor of the welfare function to allow for these different consumption patterns. Since the shadow wage and full income are endogenous, the LES is estimated simultaneously by the method of nonlinear three-stage least squares (Sonoda and Maruyama, 1999). Instruments included are land, value of productive equipment, level of education of adult household members, household size and time available for household men and women. The LES contains income elasticities for consumption of agricultural produce, other goods and home time. Labour supply, elasticities with respect to income are derived from the elasticities for home time demand (Barnum and Squire, 1979). To analyse the impact of changes in the shadow wage on labour supply and demand, following Sonoda and Maruyama (1999) labour demand and supply functions are specified. The solution to the model determines the shadow wage, activity incomes and determinants, consumption demands and household labour supply. Implications of migration for household welfare can be measured using equivalent variation (EV). EV is the minimum amount of money that the farm household requires to accept a change. From any base run scenario, the equivalent variation is monotonic with the level of utility, which would have been achieved by the change.

The agricultural household model described above forms the basis for two simulations that explore the impact of different migration policies on the welfare of migrant-sending households. A first policy to be simulated is a TMP for potential migrants from Burkina Faso to Italy. This TMP would be designed in such a way as to ensure that migration costs (e.g. travel and recruitment costs) incurred by migrants are lower than those incurred when migrating illegally. Through a bilateral agreement between the governments of Italy and Burkina Faso, migration costs could be lowered to the extent that comparatively poor households would be able to engage in intercontinental migration. Such a TMP is expected to significantly raise the number of migrant workers legally admitted and employed in Italy with anticipated positive effects on remittances.

The simulation carried out here is an increase of the allocation of labour to intercontinental migration by 10%. For comparative purposes a simulation involving a 10% increase in the allocation of labour to continental migration is also carried out.

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9 The non-food category is quite heterogeneous and includes beauty products and health care. The category of consumer durables and other expenses contains items such as radios and clothes.

10 The compensating variation (CV), which measures the amount of money that the household would accept to compensate it for the change, is not monotonic and therefore not suitable for the ordering of welfare changes (Foster and Neuburger, 1974).

11 The EV for a Stone-Geary utility function is calculated as follows (Sadoulet and De Janvry, 1995)

\[ EV = y_1 - y_0 - [e(p^1, u^1) - e(p^0, u^1)] \]
A second simulation is the granting of legal status. Up until now there is no agreement in the literature on the effect of the legal status of migrants on the amount of money remitted. When undocumented status has a positive effect on remittances, this has been explained by migrants’ more insecure and temporary situation, and thus greater need to maintain a base in their country of origin (Fairchild and Simpson, 2004; Amuedo-Dorantes and Pozo, 2006). However, such an effect could be outweighed by the earnings gap between documented and undocumented migrants. Beyond the documented/undocumented dichotomy, there are differences in residence rights of migrants that are likely to be relevant to remittance patterns, although the effect of legal status per se could be difficult to isolate from variables such as the intention to return. The data set used for this study does not contain information on the legal status of migrants and thus does not allow for an analysis of the relationship between legal status and remittances; the only meaningful relationship that can be simulated here is between the duration of absence of the migrant and remittances. The TMP discussed above could, in addition to recruitment of new migrants, legalise existing Burkinabé migrants in Italy through the granting of a temporary work and residence permit. Although detractors argue that legalisation would reward lawbreakers and encourage further illegal immigration, supporters point out that legalisation of migrants implies more tax revenue, contributes to integration and to better regulation of the underground economy. Legalisation could be combined with portability of pension and health-care benefits to Burkina Faso to stimulate return migration. Granting of legal status is expected to increase the duration of absence of the migrant. The simulation carried out here is an increase in the duration of absence by 10%.

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12 Results from a survey held by the author in Italy in 2004 with 20 migrants originating from the households surveyed in Burkina Faso, suggest that Burkinabé migrants in Italy generally do intend to return to their village of origin or the capital, Ouagadougou, but most indicated that they would wait until their retirement at which point they would receive a pension from the Italian state, if they were legalised.


IV. RESULTS

Estimated coefficients of the agricultural and self-employment production functions using two-stage least squares are given in Table 2.

Table 2. IV regression results for farm and self-employment income

<table>
<thead>
<tr>
<th></th>
<th>Log farm income</th>
<th>Log self-employment income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log household labour (days)</td>
<td>0.52 (0.13)**</td>
<td>0.54 (0.16)**</td>
</tr>
<tr>
<td>Log land (hectares)</td>
<td>0.11 (0.06)*</td>
<td>0.06 (0.05)</td>
</tr>
<tr>
<td>Log irrigated land (meters)</td>
<td>0.02 (0.01)</td>
<td>0.13 (0.06)*</td>
</tr>
<tr>
<td>Log input cost (FCFA)</td>
<td>0.20 (0.08)**</td>
<td>0.38 (0.11)**</td>
</tr>
<tr>
<td>Log value farm equipment (FCFA)</td>
<td>0.01 (0.01)**</td>
<td>-0.04 (0.01)**</td>
</tr>
<tr>
<td>Log number of cattle (FCFA)</td>
<td>0.25 (0.08)**</td>
<td>-0.16 (0.39)</td>
</tr>
<tr>
<td>Location fixed effects</td>
<td>0.53 (0.08)**</td>
<td>-0.90 (0.31)**</td>
</tr>
<tr>
<td>Hansen J-statistic</td>
<td>8.20 (0.32)b</td>
<td>5.39 (0.50)b</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.74</td>
<td>0.15</td>
</tr>
<tr>
<td>Number of observations</td>
<td>223</td>
<td>137</td>
</tr>
</tbody>
</table>

Notes: *robust standard errors in parentheses. b p-value in parentheses. *denotes significance at the 10% level. **denotes significance at the 5% level.

Source: Author’s calculations.

All inputs except irrigated land to contribute positively to output. The Hansen-Sargan over-identification test confirms the joint null hypothesis that the excluded instruments are valid, i.e. uncorrelated with the second-stage error term, and that they are correctly excluded from the estimated equation. The elasticity of output with respect to farm labour plays the most important role in determining the level of the shadow wage. Self-employment income is also labour intensive and strongly related to the level of human capital formation in the household. Again, the Hansen-Sargan over-identification test confirms the joint null hypothesis that the excluded instruments are valid.

Estimation results for participation in continental or intercontinental migration are given in Table 3.
Table 3. Multinomial regression results for determinants of migration

<table>
<thead>
<tr>
<th></th>
<th>Continental migration</th>
<th>Intercontinental migration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Household characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of adult sons</td>
<td>0.24 (0.14)*</td>
<td>0.44 (0.21)**</td>
</tr>
<tr>
<td>Log land (hectares)</td>
<td>-0.22 (0.09)**</td>
<td>0.26 (0.12)**</td>
</tr>
<tr>
<td>Log irrigated land (meters)</td>
<td>0.08 (0.07)</td>
<td>0.02 (0.12)</td>
</tr>
<tr>
<td>Education of household head</td>
<td>-0.24 (0.16)</td>
<td>-0.58 (0.30)*</td>
</tr>
<tr>
<td><strong>Individual characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average age adult males</td>
<td>0.15 (0.05)**</td>
<td>0.26 (0.07)**</td>
</tr>
<tr>
<td>Education level adult males (number of males)</td>
<td>0.06 (0.05)</td>
<td>0.13 (0.06)*</td>
</tr>
<tr>
<td><strong>Networks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past absentees</td>
<td>0.89 (0.54)**</td>
<td>0.22 (0.79)</td>
</tr>
<tr>
<td>Number of adults having attended Koranic school</td>
<td>0.06 (0.05)</td>
<td>0.19 (0.09)**</td>
</tr>
<tr>
<td>Religion (1 = Muslim)</td>
<td>-0.29 (0.54)</td>
<td>-0.42 (1.10)</td>
</tr>
<tr>
<td>Location fixed effects</td>
<td>0.95 (0.45)**</td>
<td>7.10 (2.83)**</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>175</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Robust standard errors in parentheses. *denotes significance at the 10% level. **denotes significance at the 5% level.

**Source:** Author’s calculations.

Findings demonstrate for the land variable that the two migration decisions are different strategic decisions. Continental migrants are likely to originate from poorer households, i.e. households with less land compared to households without migrants, while intercontinental migrants tend to come from wealthier households. The number of adults that have attended Koranic school has a positive, significant influence on intercontinental migration, whereas it does not explain continental migration. This finding illustrates the important role networks play in more costly intercontinental migration by lowering the entry cost of this form of migration. The positive significant location dummy indicates the importance of intercontinental migration for Niaogho and Béguédo and the importance of continental migration for Boussouma and Korsimoro.

The selectivity-corrected estimates of remittances are given in Table 4.
Table 4. Selectivity-corrected OLS estimation of remittances

<table>
<thead>
<tr>
<th>Migrant characteristics</th>
<th>Log remittances (FCFA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log labour allocation continental migration (days)</td>
<td>0.44 (0.25)**</td>
</tr>
<tr>
<td>Log labour allocation intercontinental migration (days)</td>
<td>1.07 (0.20)**</td>
</tr>
<tr>
<td>Years of absence</td>
<td>0.21 (0.11)*</td>
</tr>
<tr>
<td>Education (number of years)</td>
<td>-0.05 (0.05)</td>
</tr>
<tr>
<td>Age</td>
<td>0.26 (0.11)**</td>
</tr>
<tr>
<td><strong>Household characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Land per adult male (ha)</td>
<td>-0.18 (0.31)</td>
</tr>
<tr>
<td>Number of adult sons</td>
<td>0.17 (0.28)</td>
</tr>
<tr>
<td>Number of dependants</td>
<td>0.18 (0.11)*</td>
</tr>
<tr>
<td>Location fixed effects</td>
<td>0.86 (1.91)</td>
</tr>
<tr>
<td>IMR – continental migration</td>
<td>0.92 (1.52)</td>
</tr>
<tr>
<td>IMR – intercontinental migration</td>
<td>0.19 (0.25)</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.24</td>
</tr>
<tr>
<td><strong>Number of observations</strong></td>
<td>122</td>
</tr>
</tbody>
</table>

*Note:* *robust standard errors in parentheses. *denotes significance at the 10% level. **denotes significance at the 5% level.

*Source:* Author’s calculations.

Table 4 shows that the destination of a migrant is a strong determinant of transfers sent back to the household, with remittances from intercontinental migration being much higher compared to those from continental migrants. In micro-level analyses of the determinants of remittances, coefficients for the migrant’s length of stay abroad indicate the degree of remittance decay. Table 4 demonstrates that a positive, significant relationship exists between duration of absence and remittances and thus that the ‘remittance decay hypothesis’ is not supported here. In fact, a positive relationship exists between duration of absence and remittances, with migrants that have been absent for longer remitting more, perhaps due to them having become more settled in the host region. The finding that migration may take some time to reach ‘maturity’ at which point remittances are regular and reliable are similar to those of Garson and Tapinos (1981) on remittances from France who found that migrants did not reach the maximum level of remittance transfer until several years after they arrived. Similarly to findings by Gubert (2002) for Mali, the positive relation to the number of dependants and remittances could be an indication of altruistic motives for remitting.

Estimation results of the LES system and derived elasticities are given in Table 5.
Table 5. Linear Expenditure System

<table>
<thead>
<tr>
<th></th>
<th>Subsistence consumption</th>
<th>Budget share</th>
<th>Elasticities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own produced food</td>
<td>61 500 (82 673)*</td>
<td>0.21 (0.03)**</td>
<td>0.82</td>
</tr>
<tr>
<td>Purchased food</td>
<td>80 622 (29 477)**</td>
<td>0.08 (0.01)**</td>
<td>0.54</td>
</tr>
<tr>
<td>Non food</td>
<td>108 220 (48 431)**</td>
<td>0.12 (0.02)**</td>
<td>0.70</td>
</tr>
<tr>
<td>Durables and other expenses</td>
<td>35 230 (21 232)*</td>
<td>0.05 (0.01)**</td>
<td>0.84</td>
</tr>
<tr>
<td>Education</td>
<td>9 156 (138 714)**</td>
<td>0.01 (0.00)**</td>
<td>1.00</td>
</tr>
<tr>
<td>Home time (days)</td>
<td>447 (961)</td>
<td>0.53</td>
<td>1.47</td>
</tr>
<tr>
<td>Labour supply (income)</td>
<td></td>
<td>-1.56</td>
<td></td>
</tr>
<tr>
<td>Labour supply (wage)</td>
<td></td>
<td>2.39</td>
<td></td>
</tr>
</tbody>
</table>

Notes: * standard error in parentheses. *denotes significance at the 10% level. **denotes significance at the 5% level.

Source: Author’s calculations.

Results from the two simulations are given in Table 6. Simulation results show that outcomes strongly differ for the different migrant destinations. A 10% increase in the allocation of labour to continental migration (sim 1) leads to a loss of labour allocated to agricultural and self-employment activities; this loss of labour leads to a fall in income. In response to this income loss, households reduce their consumption of goods and of home time. The resulting larger labour supply tempers the income loss but does not offset it and continental migration leads to a reduction in welfare. Continental migration also increases the marginal value product of labour in agriculture and consequently the shadow wage - the opportunity costs of time of household workers estimated from the agricultural production function (see appendix). A higher shadow wage implies that the consumption of home time becomes more expensive. Household members would thus like to supply more labour to agriculture and self-employment activities. However, demand for labour has actually fallen due to this higher shadow wage. A higher shadow wage also means that the value of home time consumption increases, tempering the loss in shadow full income so that with the adjustment in the shadow wage, a 10% increase in labour allocation to continental migration would lead to a fall in income. This finding must be qualified by noting that migration also results in a reduction in household size which implies that income per capita might still increase.
Table 6. Migration simulations

<table>
<thead>
<tr>
<th></th>
<th>Sim (1)</th>
<th>Sim (2)</th>
<th>Sim (3)</th>
<th>Sim(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture (%)</td>
<td>-1.16</td>
<td>-0.02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-employment (%)</td>
<td>-1.20</td>
<td>-0.02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Remittances (%)</td>
<td>4.40</td>
<td>10.70</td>
<td>10.70</td>
<td>2.10</td>
</tr>
<tr>
<td><strong>Consumption effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own food (%)</td>
<td>-0.60</td>
<td>0.04</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Purchased food (%)</td>
<td>-0.39</td>
<td>0.03</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Non food (%)</td>
<td>-0.52</td>
<td>0.04</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Durables (%)</td>
<td>-0.61</td>
<td>0.04</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Education (%)</td>
<td>-0.73</td>
<td>0.05</td>
<td>0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>Home-time (%)</td>
<td>-1.08</td>
<td>0.07</td>
<td>0.09</td>
<td>0.02</td>
</tr>
<tr>
<td>Labour supply (%)</td>
<td>1.14</td>
<td>-0.08</td>
<td>-0.10</td>
<td>-0.02</td>
</tr>
<tr>
<td>Shadow full income (%)</td>
<td>-0.72</td>
<td>0.05</td>
<td>0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>EV (FCFA)</td>
<td>-2 670</td>
<td>2 064</td>
<td>2 140</td>
<td>1 834</td>
</tr>
<tr>
<td><strong>Shadow wage effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shadow wage (%)</td>
<td>0.55</td>
<td>0.06</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>Labour supply (%)</td>
<td>1.30</td>
<td>0.13</td>
<td>0.20</td>
<td>0.02</td>
</tr>
<tr>
<td>Labour demand (%)</td>
<td>-0.25</td>
<td>-0.03</td>
<td>-0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Shadow full income (%)</td>
<td>-0.50</td>
<td>0.07</td>
<td>0.10</td>
<td>0.02</td>
</tr>
<tr>
<td>EV (FCFA) with shadow wage change</td>
<td>-1 335</td>
<td>2 160</td>
<td>2 357</td>
<td>1 850</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

When, instead, the allocation of labour to intercontinental migration increases by 10% (sim 2), the picture is completely different. The much larger remittances compensate for the lost-labour effect, so that shadow full income increases despite a loss of labour to migration and more consumption of home time due to the income effect. The shadow wage increases significantly and labour demand in agriculture and self-employment activities falls as a consequence. However, home time consumption also becomes more expensive, leading to an overall increase in shadow full income. When 10% of labour is relocated from continental to intercontinental migration (sim 3), the lost-labour effect does not arise, but the resulting higher income still implies a reduction in household supply of labour. The shadow wage increase is thus significant and demand for labour falls, resulting in less income generated in agriculture and self-employment activities, tempering the increase in shadow full income.

A 10% increase in duration of absence (sim 4) increases remittances by about 2.1%. The household has already induced the labour loss so initial production effects do not arise. However, the income increase due to larger remittances leads households to consume more of all normal goods including home time thereby reducing their supply of labour to productive activities, agriculture and self-employment. Less labour allocated to agriculture raises the
marginal value product of labour and consequently the shadow wage. An increase in the shadow wage implies that the consumption of home time becomes more expensive. Household members would thus like to supply more labour to agriculture and self-employment activities. However, demand for labour does not change so that this extra supply cannot be absorbed and the value of output falls. Despite the reduction in the value of output from agriculture and self-employment activities, household welfare improves substantially if the duration of stay abroad of a migrant increases.

These simulation results show that, in contrast to continental migration, welfare effects of increased household engagement in intercontinental migration, both in terms of more migration and a longer duration of absence, are substantial. However, it needs to be borne in mind that although household welfare improves, a missing market for labour means that labour-intensive productive activities are crowded out in the short-run. In terms of policy recommendations, welfare effects of intercontinental migration on the sending economy are thus likely to be maximised if host countries introduce a TMP, lowering the cost of legal migration thereby opening up this avenue of income generation for relatively poor households while at the same time stimulating return after migrant work permits have expired so that “Dutch-disease” effects can be mitigated in the long run. In addition to stimulating new, legal migration, such a TMP could also involve the legalisation of already existing migrants.
V. CONCLUSIONS AND POLICY IMPLICATIONS

In this paper, I have used an agricultural household model and data from the Central Plateau of Burkina Faso to explore the impact of potential migration policy reforms in Europe on the welfare of rural households in Burkina Faso. Findings demonstrate that, in contrast to continental migration, intercontinental migration, which is much more lucrative in terms of remittances, is accessible only to comparatively wealthy households. Simulation results demonstrate that an increase in continental migration would not improve household welfare, as production losses due to reduced supply of labour would not be offset by remittances. In contrast, increased intercontinental migration would have strong positive welfare effects, much more substantial remittances compensating for the loss in income induced by the lost-labour effect. Similarly, an increase in the stay abroad of intercontinental migrants would impact positively on welfare.

Results of these simulations lend support to the introduction of a TMP which, by lowering the cost of intercontinental migration, would enable poorer households to engage in this activity. The temporary nature of such a program would ensure that “Dutch disease” effects, where migration increases the price of tradeables good (labour) and crowds out local labour-intensive activities, would be mitigated through eventual migrant return. Granting of legal status to migrants already abroad through a temporary work and residence permit is also recommended if the objective is to improve the welfare of migrant-sending households. Legalisation of these migrants is expected to prolong their stay abroad, thereby increasing remittances while avoiding a loss of labour and thus entailing a significant improvement in household welfare. Legalisation can be granted under the same TMP in order to encourage the eventual return of migrants.
Summary of Equations in Agricultural Household Model

Utility function

\[ U = U(C_a, C_i, H) \quad i = pf, nf, du, ed \]  \hspace{1cm} (1)

\( C_a \) demand for agricultural produce
\( C_i \) demand for other goods
\( H \) demand for home-time

Time constraint

\[ \sum_k L_k + H = \bar{T} \quad k = a, n, c, ic \]  \hspace{1cm} (2)

\( \bar{T} \) equal total time of active household members

Budget constraint

\[ Y^* = p_a C_a + \sum_i p_i C_i + H \bar{w} \]  \hspace{1cm} (3)

\( p_a \) prices of agricultural produce
\( p_i \) prices of other goods and home time valued at the shadow wage

\( \bar{w} \) shadow wage

Full income

\[ Y^* = \pi_a + \bar{w} \bar{T} + \pi_n + R_{\text{c,ic}} \]  \hspace{1cm} (4)

\[ \pi_a = p_a Y_a - \bar{w} L_a - q_a V_a \]  \hspace{1cm} (5)

\[ \pi_n = p_n Y_n - \bar{w} L_n \]  \hspace{1cm} (6)

\[ Y_a = f_1(L_a, V_a, \bar{A}) \]  \hspace{1cm} (7)

\[ Y_n = f_2(L_n, \bar{A}) \]  \hspace{1cm} (8)

\[ R_{\text{c,ic}} = f_4(L_c, L_{\text{ic}}, Z_r) \]  \hspace{1cm} (9)

\[ L_{\text{c,ic}} = f_3(\bar{A}, N) \]

\( Y_a \) agricultural output.
\( Y_n \) output of non-farm activities.
\( R_{\text{c,ic}} \) remittances
\( L_a \) labour supply to agriculture
\( L_n \) labour supply to non-farm activities.
Continental vs. intercontinental migration: an empirical analysis of the impact of immigration reforms on Burkina Faso

\[ L_c \] labour supply to continental migration
\[ L_{ic} \] labour supply to intercontinental migration
\[ V_a \] tradable inputs
\[ \bar{A} \] household assets
\[ N \] networks
\[ Z_r \] migrant and household characteristics
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