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## Supply and Demand Side Limitations Affecting the Structure of Agriculture and the Rural Economy

### ABSTRACT

This paper criticises the neo-classical assumptions of perfect factor markets and of complete information, which constitute central elements in labour market theory. Based on a literature review and on economic reports from transition economies, as well as developing countries and more advanced economies, this deliverable focuses on the structural impediments and imperfections that often characterise rural labour markets and that may prevent an efficient allocation of labour. According to empirical studies, transactions costs and rigidities hinder the well-functioning of labour markets and constrain labour adjustments. The paper attempts to classify the various limitations of rural labour markets from both the supply and demand side, although the distinction is not always clear-cut as some problems occur on both sides. The identification of these issues is extremely important as it allows us to highlight the inefficiencies and the failures in labour markets and to understand their impact on labour allocation. In this context, market intervention is desirable and the paper provides particular support for rural development policies such as investments in human capital. Lastly, labour institutions can play a key role in promoting the efficient functioning of labour markets, and thus it is fundamental that they are well established.

FACTOR MARKETS Working Papers present work being conducted within the FACTOR MARKETS research project, which analyses and compares the functioning of factor markets for agriculture in the member states, candidate countries and the EU as a whole, with a view to stimulating reactions from other experts in the field. See the back cover for more information on the project. Unless otherwise indicated, the views expressed are attributable only to the authors in a personal capacity and not to any institution with which they are associated.

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# **Supply and Demand Side Limitations Affecting the Structure of Agriculture and the Rural Economy**

**Barbara Tocco, Sophia Davidova and Alastair Bailey\***

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## **1. Introduction**

The large body of literature which examines the determinants of labour allocation decisions of rural households often rely on the neoclassical assumptions of perfectly competitive factor markets and complete information, where the level of employment is simply determined by the intersection of the aggregate labour supply and aggregate labour demand. In order to understand the functioning of rural labour markets in the EU, it is fundamental to take into account factor market imperfections and transactions costs which affect labour adjustments. In particular, empirical studies have emphasised the presence of rigidities and constraints which affect rural labour markets and which hinder labour adjustments across sectors.

The objective of this paper is to highlight the structural constraints which characterise rural labour markets and agriculture, affecting labour market participation and labour supply decisions of rural households, and often leading to an inefficient allocation of labour. Therefore, we provide a review of the main limitations from the supply and demand side point of view. The information on these has been extracted from international organisations reports, such as the International Labour Organisation and the European Commission, and from additional empirical studies, especially from economies in transition but also from developing countries and more developed countries. Furthermore, although these constraints are not necessarily present in all rural labour markets, where they do exist, their importance cannot be neglected.

This information is of particular interest as it helps to explain labour rigidity behaviour and lack of responsiveness to market opportunities in the presence of structural constraints. The identification of the limitations of rural economies entails a better targeting of policies for both addressing the specific needs and for correcting market inefficiencies.

As presented in this paper, rural labour markets appear to be characterised by a series of constraints including the impoverishment of rural areas in terms of low levels of human capital and aged population, imperfect and asymmetric information, uncertainty and risk aversion, limited access to land and capital, slow economic growth, lack of job opportunities, poor infrastructure and services provision, and so forth.

## **2. Rural labour markets: Failures and constraints**

According to the competitive market assumptions, labour market equilibrium is generated automatically as an efficient allocation, as envisaged by Adam Smith's 'invisible hand', where workers and firms find each other (Borjas, 2005). The equilibrium level of employment and the competitive wage are thus determined by the intersection of aggregate supply and aggregate demand. One of the main predictions of a competitive equilibrium is the fact that there is no involuntary unemployment, as all workers who wish to work can find a job at the

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equilibrium wage. Moreover, perfectly competitive markets would imply perfect factor mobility, perfect information and zero transaction costs.

According to the ILO (2008), well functioning labour markets are so defined when they satisfy two primary conditions: efficiency and fairness. Efficiency would imply that all workers who are willing to work at the market wage are likely to find quickly suitable jobs matching their level of skills, education and experience. Fairness depends on whether the wage paid equals the value of the marginal product of labour. Furthermore, well functioning labour markets are characterised by a good provision of social protection.

In reality, as emphasised by several studies, rural labour markets are often characterised by market failures and imperfections (Benjamin, 1992; Sadoulet and de Janvry, 1995; Rizov and Swinnen, 2004; Kancs, Swinnen, and Vranken, 2009), including transaction costs, which result in decreasing market participation (Key, Sadoulet and de Janvry, 2000). As suggested by Rizov and Swinnen (2004), market imperfections have a significant impact on the labour allocation decisions of households, as physical and human capital factors affect mobility costs. Moreover, the presence of considerable labour market constraints limits the ability of individuals to engage in off-farm activities (Swinnen, Dries, and Mathijs, 2001). Imperfections and rigidities in the labour market imply that labour is not fully employed or is imperfectly mobile across economic activities and thus prevent an efficient allocation of labour.

In order to highlight the structural impediments and constraints which hinder an efficient allocation of labour and which may affect the structure of the rural economy and the agricultural sector, it is necessary to look at the supply and demand side limitations that characterise rural labour markets (Table 1).

**Table 1. Supply and Demand Side Limitations Affecting Rural Labour Markets**

Supply-Side Limitations	Demand-Side Limitations
<ul style="list-style-type: none"> <li>• Low levels of education, skills, training and experience</li> <li>• Demographic ageing</li> <li>• Imperfect information</li> <li>• Uncertainty and risk aversion</li> <li>• Limited access to land and capital</li> <li>• Occupation/residential choice paradigm</li> </ul>	<ul style="list-style-type: none"> <li>• Slow economic growth and lack of job opportunities</li> <li>• Poor public and private investment: infrastructure, services, transportation and communication systems</li> <li>• Structural unemployment</li> <li>• Few diversification opportunities</li> <li>• Low incomes</li> <li>• Seasonality in agriculture</li> <li>• Imperfect information and supervision</li> <li>• Poor social protection and market failures</li> </ul>

Source: Own compilation from different sources.

The distinction between supply and demand side is not completely clear-cut but is often blurred, as some problems arise on both sides, as in the case of imperfect information. By the same token, many aspects are interconnected so that some supply-side limitations have implications on the demand for labour, as it is the case for low levels of human capital and limited access to land and capital.

By recognising the challenges faced by rural households, the paper offers insights into the policies which must be pursued in order to promote more and better quality employment in rural areas. The following sections provide a detailed description of the different sources of limitations, compiled according to supply and demand, which affect the allocation of labour.

### **3. Supply side limitations**

#### ***3.1 Low levels of education, skills, training and experience***

Rural labour markets are generally characterised by unskilled labour where supply comes from workers with little formal education or training and with levels of education below national level and with striking disparities in comparison to urban areas. Not only do poor skills result in low productivity in agriculture but they also entail restrictions in the choice of work that can be undertaken, often leading to lower paid, part-time or seasonal work.

Moreover, education is the most important variable for entry in the non-farm economy: as supported by a large body of literature, schooling, which proxies for knowledge and skills, is positively and significantly associated with participation in rural non-agricultural wage employment (Huffman, 1980; Sumner, 1982; Kimhi, 1994; Corsi and Findeis, 2000; Goodwin and Holt, 2002; Juvančič and Erjavec, 2005; Benjamin and Kimhi, 2006; Ahearn, El-Osta, and Dewbre, 2006, and so forth), and decreases participation in agricultural activities (Lopez, 1984; Fall and Magnac, 2004; Rizov and Swinnen, 2004). This would imply that low levels of training and transferable skills constrain workers' ability to take up off-farm work.

Empirical studies have looked at the mobility of labour and have found that, especially in economies during transition, the level of labour mobility was lower than expected. In this context, Juvančič and Erjavec (2005) focused on the importance of structural problems constraining inter-sectoral mobility in Slovenia and concluded that the rigidity in labour supply is a consequence of the poor educational attainment of farm holders and thus of the correspondingly uncompetitive position at the off-farm labour market.

Therefore, general and specific education, vocational training and work experience affect the mobility costs and influence labour allocation decisions (Macours and Swinnen, 2005), constituting a significant impediment to labour mobility and therefore to an efficient allocation of labour (Dries and Swinnen, 2002). The inadequate levels of human capital represent an important supply side limitation which constrains the supply of skilled labour from the agricultural sector and constitutes a barrier for those seeking alternative employment. Studies have found that those with the lowest education and work experience are the ones more likely to become long-term unemployed during transition (Dries and Swinnen, 2002) as they are 'handicapped' in their attempts to find alternative jobs. For instance, workers who were previously employed on large state farms and got laid-off in the period of privatisation stayed unemployed instead of taking up self-employment as individual farmers, as they lacked the practical and managerial experience to start a business (Swinnen, Dries and Mathijs, 2001).

#### ***3.2 Demographic ageing***

An important stylised fact of rural areas is the unfavourable ageing of the population. As emphasised by the European Commission (2006), demographic ageing in rural areas is an important issue, as it reduces future labour supply and employment levels of the working age population, resulting in lower productivity growth and thus hampering economic development. This phenomenon has been strengthened by the out-migration of the young and more skilled people to seek better employment opportunities in urban areas. As a consequence, since agriculture represents the main employer of labour in rural areas, this sector is characterised by the less skilled and the elderly which, being less mobile and flexible, stay and work in the agricultural sector. This leads to an inefficient labour allocation on agricultural holdings as well as to an impoverishment in terms of human capital in comparison to other sectors (Van Herck, 2009).

### ***3.3 Imperfect information***

Unemployment and labour immobility can also be a consequence of imperfect information, i.e. poor or incomplete information about the location and availability of jobs or better employment conditions (Kancs, Swinnen and Vranken, 2009). Especially in agriculture there are significant costs of job search and the seasonal demand for labour in farm production lead to uncertainty over the obtainment of wage labour (Ellis, 1993). As emphasised by the ILO (2008), information is a vital resource and thus policy tools need to be in place in order to ensure that rural workers are aware of favourable job opportunities, and hence promote rural employment. In these regards, information and communications technologies are fundamental for the facilitation of employment services.

### ***3.4 Uncertainty and risk aversion***

According to economic theory, farmers make their labour allocation decisions with the objective to maximise their utility, and thus divide labour supply between on-farm and non-farm activities such that the marginal returns to all activities are equal. Nonetheless, if farmers are risk averse, less time will be allocated to the more risky activities when the returns are the same, meaning that farmers will rather work in a less risky environment with lower wages (Davis and Pearce, 2001).

Agricultural activities are subject to variable weather and volatile markets which determine yields and prices. Imperfect insurance against risk presents an important constraint for rural households as the mechanisms to mitigate variation in production plans are underdeveloped (Kevane, 1996). On one hand, without adequate access to risk insurance, rural households are likely to withhold on innovation, preventing the adoption of new activities or the expansion of new ones (ILO, 2008); on the other hand, poorer farmers will substitute higher expected yields, associated with greater risks, to safer investments (Kevane, 1996). Lastly, returns from off-farm employment can be used to reduce the total variance of their income (Davis and Pearce, 2001), suggesting a stabilising effect on total household income (Glauben, Tietje, and Weiss, 2003).

### ***3.5 Limited access to land and capital***

Important supply-side constraints in agriculture concern the limited access to land and capital, which are worsened by the inability to access credit. This leads to the inability to invest in farm technology and equipment, which are often obsolete and in need for modernisation (Swinnen, Dries and Mathijs, 2001), as well as to invest in the start-up of firms and in other off-farm income generating activities (ILO, 2008), with important constraints for the income and employment opportunities of rural households.

As recognised by Rizov and Swinnen (2004), whereas in perfect markets farm capital assets would only have an income effect on labour supply, thus reducing the labour input, in imperfect factor markets farm capital assets do have an impact on the demand for labour. In essence, capital market imperfections, such as limited access to technology or other capital inputs, increase the effective price of this factor market and thus, through a substitution effect, they increase agricultural labour employment (Dries and Swinnen, 2002). By the same token, the existence of credit market imperfections, due to insufficient liquid assets and access to credit, spills over into labour markets, as the household would have to rely on wage employment (Kevane, 1996). On the other hand, non-earned income would relax the liquidity constraint and thus allow one to have a larger farm, inducing more labour allocation (Rizov and Swinnen, 2004). Moreover, it has often been suggested that social capital and family links play a key role in agriculture, as they provide access to capital and land needed for farming, hence reducing the probability of unemployment for farm household members (Swinnen, Dries and Mathijs, 2001).

### ***3.6 Occupation/residential choice paradigm***

A further constraint to rural households is embodied in the 'occupation/residential choice paradigm' (Johnson, 1991). In essence, the choice of farming imposes severe restrictions on residential choice, and at the same time, the choice of a farm residence greatly reduces family's employment opportunities across sectors. This stems from the fact that due to the geographical dispersion of agriculture and to its rural location away from other industries, there are high costs of obtaining information about other employment opportunities, as well as high costs of movement given by the distance between rural and urban areas, which are exacerbated by the lack of transport and communications. As a consequence, rural people are 'trapped' in their labour decisions.

## **4. Demand side limitations**

### ***4.1 Slow economic growth and lack of jobs opportunities***

Rural areas, in comparison to urban areas, are usually lagging behind in terms of socio-economic indicators and are characterised by low levels of GDP per capita and thus lower standards of living, lower incomes, and limited access to services and quality products (European Commission, 2006). In a vicious circle, the slow economic growth and low levels of income of rural areas make it even harder to attract skilled individuals, which are instead pulled into more prosperous regions, with further impoverishment of rural areas in terms of human capital and productivity growth. On the other hand, high value added generated by the service sector, investment and access to capital help the creation of employment potential in urban areas.

It has often been acknowledged that unfavourable labour market conditions, and specifically the lack of jobs opportunities, represent one of the main demand-side constraints of rural labour markets and to the mobility of agricultural labour (Juvančič and Erjavec, 2005). Hence, in order to facilitate structural change it is fundamental to create employment opportunities in rural areas (Van Herck, 2009). As emphasised by the ILO (2008), economic growth is a necessary, although not sufficient, condition for promoting rural employment. Therefore, while aiming at the main drivers of economic growth, namely capital investment, human capital development, and expanding markets, it is fundamental to focus specifically on increasing productivity and promoting the diversification of income and employment opportunities in rural areas.

### ***4.2 Poor public and private investment: Infrastructure, services, transportation and communication systems***

Growth in rural areas and in agriculture depends on investments in physical infrastructure, such as roads and telecommunications, in agricultural research and extension, and in public health and education (ILO report 2008).

Rural areas are often characterised by poor infrastructure, with poorly maintained roads and difficult access to information and communication facilities (Swinnen, Dries and Mathijs, 2001). This, not only constitutes a mobility constraint for non-farm employment, thus preventing an efficient adjustment of labour (Dries and Swinnen, 2002), but it also increases uncertainty and restricts market opportunities for farmers (ILO, 2008). As emphasised by de Janvry, Fafchamps and Sadoulet (1991), poor infrastructure, non-competitive markets and poor information all lead to high transaction costs.

Moreover, social safety nets, health services and education opportunities require increased investment in order to enhance the development of non-farm activities in more remote rural areas (Davis and Pearce, 2001).

### ***4.3 Structural unemployment***

One of the stylised facts of rural areas is the level of unemployment, direct and hidden (Davis and Pearce, 2001), which is significantly higher compared to urban areas. According to Swinnen, Dries and Mathijs (2001), high unemployment levels in rural areas are often of a structural nature, due to insufficient education and skills of workers. This would imply that there is an imbalance between the supply and the demand for labour, due to a mismatch between the skills that workers are supplying and the skills that firms are demanding (Borjas, 2005). Therefore, due to inadequate specific education and vocational training individuals are handicapped in their attempts to find alternative employment.

### ***4.4 Few diversification opportunities***

Low mobility of rural households and high levels of on-farm employment despite small farm assets would suggest that there are very few opportunities for alternative income sources and jobs outside agriculture (Juvančič and Erjavec, 2005), which constitute structural impediments for labour adjustments (Schnicke, Happe and Sahrbacher, 2007). As also suggested by Davis and Pearce (2001) individuals' decisions on the cessation or continuation of farm work can either depend on the favourable situation in off-farm labour markets, i.e. demand-pull factors, or as part of a survival strategy in case of rigidity of off-farm labour markets, i.e. distress-push factors. As suggested by the ILO (2008), rural non-farm activities are often constrained by low market demand, especially in predominantly rural areas, with low population density and a high percentage of poverty. On the other hand, as previously illustrated, smallholders are constrained by a lack of access to inputs and services, as well as low human capital and inappropriate technology, which prevent them from diversifying production into higher-value products (ILO, 2008).

### ***4.5 Low incomes***

Incomes in rural areas, and wages in agriculture, tend to be low with generally a wide divide with urban areas. Low human capital, low incomes and low quality jobs constrain the opportunities and living conditions of rural people. Moreover, social protection is usually less developed in rural areas, with some countries excluding agricultural workers from minimum wage protection and others not including specific types of workers, such as part-time workers, casual workers, seasonal workers and so forth, which characterise rural and specifically agricultural activities (ILO, 2008). Since wages and social protection systems are an indicator of welfare and economic development, rural areas tend to score low and confirm the fact that they lag behind in terms of socio-economic indicators, representing significant demand-side constraints for attracting skilled individuals.

### ***4.6 Seasonality in agriculture***

A further limitation concerns the seasonal nature of agricultural activities, which cause fluctuations in labour demand and labour productivity and result in seasonal employment patterns, seasonal migration, with sharp wage variations, widespread unemployment and the dominance of casual over regular employment (ILO, 2008). Rural people are subject to seasonal migration, as they are pulled into agriculture during the peak season and are released during the slack season, seeking other employment opportunities or becoming unemployed. Furthermore, risks of weather and volatility of prices also tend to reduce the demand for labour.

### ***4.7 Imperfect information and supervision***

Lastly, the demand for agricultural labour is characterised by agency problems. Spatially scattered agricultural operations increase monitoring costs, due to moral hazard and adverse selection, which represent high transaction costs in labour hiring and labour supervision. The main reasons for the principal-agent problem are imperfect and asymmetric information. Imperfect information is particularly important for large farms where labour is mainly hired

and therefore increasing amounts of time and resources must be utilised to supervise labour, implying high transaction costs (Kevane, 1996). As a consequence, differing efficiencies of family and hired labour lead to their imperfect substitutability and represent labour market imperfections.

In order to reduce the information problem, it has often been suggested that sharecropping represents the best solution, as the landowner gains complete information over farm inputs and outputs (Ellis, 1993). In general, institutions and labour contracts represent an important means of reducing the transaction costs of exchanges in labour markets, and thus a viable solution to address market imperfections.

#### **4.8 Poor social protection and market failures**

Well functioning labour markets, in terms of efficiency, fairness and social protection, can be promoted through labour market institutions, which aim to ensure good labour market governance (ILO, 2008). Differences in labour market institutions characterise the divergent economic performance across countries. In general, labour codes and social protection tend to be underdeveloped or poorly implemented in rural areas, especially due to the large amount of self-employment, casual labour and informal agreements which are out of reach for governments. Furthermore, for those more remote rural areas, the poor provision of public infrastructure, in terms of transport and communications, makes social protection more difficult to deliver.

Since market institutions, policies and regulations constitute important determinants for the allocation of labour as well as income distribution, when they are not properly in place they might lead to market failures. This is of particular interest to rural labour markets, as policies often tend to benefit larger and commercially oriented producers with good connections to markets and infrastructure, and thus often result in negative outcomes for the poorest groups. When government policy interventions lead to outcomes which are not pareto efficient, as it has often been advocated in the case of farm subsidies, they entail an inefficient allocation of resources.

### **5. Conclusions and policy implications**

The contribution of the paper consists in emphasising the different constraints which are common to rural markets and which may affect the allocation of labour in these areas. Although these limitations do not necessarily apply to more developed economies, they are relevant to the EU new Member States and surely to underdeveloped countries. Nonetheless, some of the constraints may be present in some of the less developed areas in the old member states (EU-15), although to a lesser extent. To this purpose, our next deliverable within the Factor Markets Project (D8.3) will look at the developments and constraints across the 27 member states.

Therefore, the concluding remarks contain some policy implications in regards to the impediments herein discussed. In order to improve the functioning of the labour markets it is essential to remove the constraints. Hence, market intervention is needed to reduce the distortions and to foster rural development. Rural development policies must focus on the promotion of extensive programmes to support education and vocational training and to invest in human capital. Expenditure on education should target at upgrading managerial and employability skills, with the purpose of improving factor mobility and thus toward a more efficient allocation of labour. These policies would improve labour productivity, and thus the profitability in agriculture and in existing rural non-farm enterprises, shifting those people who are underemployed into alternative activities, reducing unemployment and increasing income levels.

Moreover, investments in human capital and support programmes to enter more productive and thus remunerative labour markets could facilitate diversification in rural areas. Non-farm activities are extremely important in terms of rural development as they absorb the

excess labour from agriculture and represent a survival strategy for many rural households in providing income and employment. More importantly, emphasis should be placed on the development of rural small and medium enterprises which tend to be labour-intensive and thus are likely to be pro-poor.

By the same token, investments in infrastructure are crucial for improving rural markets and for strengthening rural-urban linkages, hence facilitating market access and creating better employment opportunities. A further focus point consists in supporting agricultural extension as well as small business development, reducing capital constraints and providing access to credit, markets, technical information and assistance. Adequate transport and communications are necessary in rural areas in order to stimulate productivity, provide linkages with the wider economy and thus lead to improved and more efficient labour outcomes.

In addition to this, the government can play a role in bridging the gap of incomplete information, by strengthening market information systems and assisting rural households in finding more and better employment and training opportunities. In this respect, market intervention can improve information about markets, such as providing more information on job opportunities to ease the search for a job.

Lastly, labour market institutions can promote the well functioning of labour markets, in terms of efficiency, fairness and social protection. Effective regulations and labour codes provide the fundamentals for good governance and are thus extremely important for delivering development outcomes.

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## Comparative Analysis of Factor Markets for Agriculture across the Member States

245123-FP7-KBBE-2009-3

### The Factor Markets project in a nutshell

<b>Title</b>	Comparative Analysis of Factor Markets for Agriculture across the Member States
<b>Funding scheme</b>	Collaborative Project (CP) / Small or medium scale focused research project
<b>Coordinator</b>	CEPS, Prof. Johan F.M. Swinnen
<b>Duration</b>	01/09/2010 – 31/08/2013 (36 months)
<b>Short description</b>	<p>Well functioning factor markets are a crucial condition for the competitiveness and growth of agriculture and for rural development. At the same time, the functioning of the factor markets themselves are influenced by changes in agriculture and the rural economy, and in EU policies. Member state regulations and institutions affecting land, labour, and capital markets may cause important heterogeneity in the factor markets, which may have important effects on the functioning of the factor markets and on the interactions between factor markets and EU policies.</p> <p>The general objective of the FACTOR MARKETS project is to analyse the functioning of factor markets for agriculture in the EU-27, including the Candidate Countries. The FACTOR MARKETS project will compare the different markets, their institutional framework and their impact on agricultural development and structural change, as well as their impact on rural economies, for the Member States, Candidate Countries and the EU as a whole. The FACTOR MARKETS project will focus on capital, labour and land markets. The results of this study will contribute to a better understanding of the fundamental economic factors affecting EU agriculture, thus allowing better targeting of policies to improve the competitiveness of the sector.</p>
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<b>Partners</b>	17 (13 countries)
<b>EU funding</b>	1,979,023 €
<b>EC Scientific officer</b>	Dr. Hans-Jörg Lutzeyer

