

FACTOR MARKETS FINAL REPORT



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Final publishable summary report

1. Executive summary

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. Such changes can be the result of technological change, of globalisation and European market integration, of changing consumer preferences, and of changes in policy. In particular, changes in the Common Agricultural Policy (CAP) in the recent decade have affected rural factor markets.

While agricultural and food markets are fully integrated in the European single market, subject to an EU-wide common policy, the CAP, this is not necessarily the case for factor markets. Specific member state regulations and institutions affecting land, labour and capital markets may cause important heterogeneity across factor markets in the different member states. Obviously such variations are likely to have a potentially important effect, not just on the functioning of factor markets, but also on the competitiveness of the agricultural sector, on structural change, and rural development in general. Moreover, these variations are also likely to cause country specific interactions between factor markets and the CAP, as they may react differently to reforms, and because they may cause differential effects of the reforms.

The general objective of the Factor Markets project was to analyse the functioning of factor markets for agriculture in the EU-27, including the Candidate Countries. The Factor Markets project compared 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 focused on **capital, labour and land markets**. The **capital market** analysis (WPs 2-7) looked at various forms of capital and study, among others, the determinants of sectoral investment decisions, including CAP instruments, and the impact of investments on technological change and capital stocks. The **labour market** analysis (WPs 8-13) included, for example, the analysis of human capital mobility in the EU agricultural sector as well as off-farm labour supply. The **land market** analysis (WPs 14-19) looked at both rental and sales markets, and studies, among others, the impact of the capitalisation of support into land values and factors determining land transfers.

The Factor Markets project provided the first comparative study covering all rural factor markets in Europe, highlighting their diversity - despite a common agricultural policy and an integrated single market. Its results represent a timely and valuable source of information given the new CAP reforms and the continuing transformation of the EU's rural areas.

2. Summary description of project context and objectives

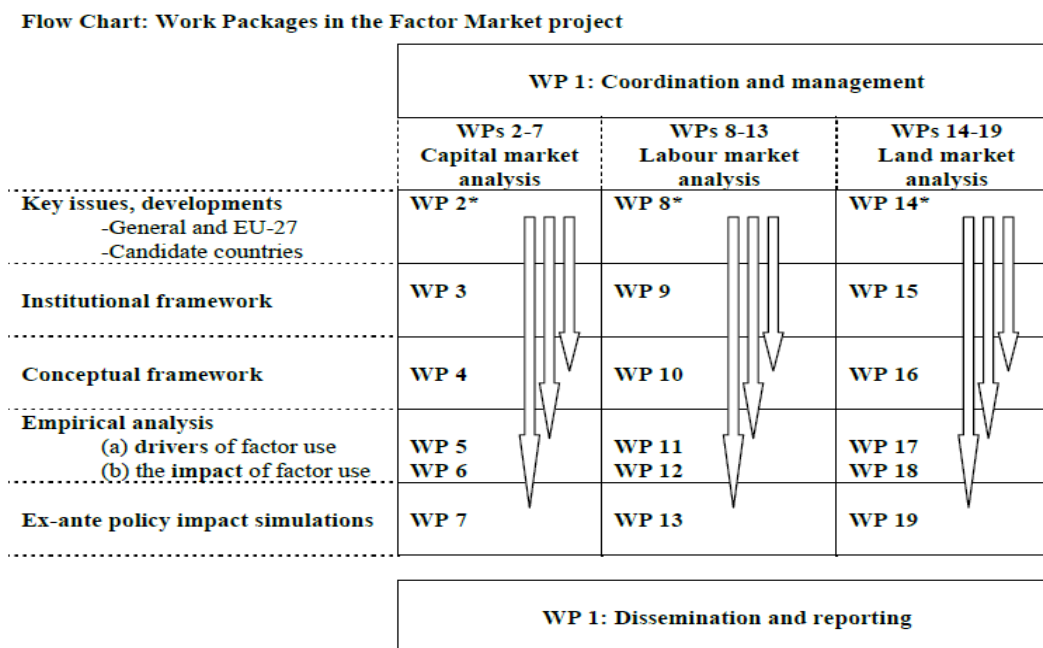
2.1 The general objectives of the project, along two dimensions

1. The Factor Markets Consortium worked towards the identification of the key issues in the capital, labour and land markets of the EU and Candidate countries, the definition of their

institutional frameworks and the development of a conceptual framework to analyse these markets (these tasks were completed in the 1st project period)

- Building on the results achieved in the 1st period, the Factor Markets Consortium aimed at drawing policy conclusions, understanding the drivers and impacts and grasping the complex interplays between the factor markets, by conducting empirical analyses on the drivers and impact of factor use and carrying out ex-ante policy impact simulations (see Flow Chart below).

Flow Chart: Work Packages in the Factor Market project



2.2 Specific objectives of the capital, labour and land market analyses

The specific objectives of the project were split across the three rural markets – capital, labour and land - and were different in the first period (31.08.2013 – 29.02.2012) and the second period (01.03.2012 – 31.08.2013). In particular:

The specific objectives of the capital market analyses of the project were:

First period

- To conduct a comprehensive literature review of the main issues in agricultural capital market and rural finance policies
- To describe capital market developments and to identify commonalities and differences in capital market developments and constraints in different EU regions
- To identify potential supply and demand side limitations of rural capital, which may affect the structure of the agricultural sector and rural economies in general
- To provide a first qualitative and quantitative comparative analysis of the capital market for agriculture in the three Candidate Countries (Croatia, FYR of Macedonia, and Turkey) as well as the impact of national and EU programmes on functioning of capital markets

- To provide a comparative analysis of the organisation and institutional arrangements of market for (rural) capital and of market for equipment in EU Member States
- To identify the relationship between the capital market performance (interest rates, total and average loan volume, default on loans, extent of credit rationing etc) and capital market institutions
- To develop a theoretical framework for the analysis of determinants and impacts of capital use
- To derive the key hypotheses for drivers of use of financial and physical capital, and to derive key hypotheses for impacts of capital use
- To derive a theoretical relationship between farm credit, vertical integration and policy support in agriculture
- To further develop existing simulation models to represent agricultural capital, capital markets and related policies in each of the EU member states.

Second period

- To analyse capital use and investment behaviour of EU farmers using micro-econometric methods
- To analyse the impact of the main EU agricultural policy tools (price support, direct payments, supply control, Single Farm Payment) on capital use and farm investment decisions
- To analyse the adoption of new information technologies with a focus on Automatic Milking System (AMS) in Northern Europe
- To comparatively analyse the market(s) for agricultural equipment in Europe
- To empirically analyse the efficiency and income effects of capital use in the EU using micro-econometric methods
- To empirically investigate the interactions between vertical integration, farm credit, agricultural policies and other drivers of farm credit
- To develop a data exchange between the simulation models MAGNET & ESIM to simulate changes in the markets and policies for capital use in agriculture
- To analyse the impact of capital market characteristics on potential policy outcomes by using the developed models
- To apply the models developed in the first period to simulate changes in policies and analysing their impact on investments.

The specific objectives of the labour market analyses of the project were:

First period

- To conduct a comprehensive literature review of the main issues in agricultural/rural labour market and labour policies (i.e. employment, skills, mobility and migration, pluri-activity)
- To identify potential supply and demand side limitations, which may affect the structure of the agricultural industry and the rural economy in general

- To identify commonalities and differences in labour market developments and constraints in different EU regions
- To provide a first qualitative and quantitative comparative analysis of key issues and development of the labour market for agriculture in the three Candidate Countries (Croatia, FYR of Macedonia, and Turkey) as well as the impact of national and EU programmes on functioning of labour markets
- To determine the institutional framework governing labour markets in the EU member countries
- To further develop the existing quantitative models to represent agricultural labour, their markets and related policies in each of the EU member states

Second period

- To finalise the theoretical framework for analysing the drivers of labour demand and supply decisions in farm households and the impact of policy on those decisions
- To finalise a theoretically consistent analytical framework and methodology to study the impact of peculiarities in different factor markets upon the demand for labour.
- To conduct an empirical analysis to identify the factors affecting labour use on farms
- To analyse the off-farm labour decisions of farm operators and identify factors affecting labour use on farms
- To analyse the main determinants of rural labour market in Poland
- To analyse the pluriactivity's role in farm exit and labour supply decisions
- To assess the effects on labour market of changes in markets of other agricultural factors of production
- To estimate the marginal impact on price, demand and earnings of labour, capital and material inputs caused by a change in the policy support and the degree of payment capitalisation into land
- To estimate the impact of potentially biased technical progress on the earnings of factors of production and in particular labour
- To econometrically study the determinants of labour force allocation between agriculture and non-agriculture in the EU at both country and regional level
- To draw conclusions on the effects of policy changes, e.g. in CAP, on the labour market.
- To further develop existing quantitative models to represent agricultural labour, their markets and related policies in each of the EU member states
- To develop a data exchange between the models applied for this WP MAGNET & ESIM and other models to simulate changes in the markets and policies for labour use in agriculture.

The specific objectives of the land market analyses of the project were:

First period

- To describe the key issues and developments on the EU-27 land markets;

- To provide a first qualitative and quantitative comparative analysis of key issues and development of the land market for agriculture in the three Candidate Countries (Croatia, FYR of Macedonia, and Turkey) as well as the impact of national and EU programmes on functioning of land markets
- To identify and describe the key land market institutions in the EU-27, including Candidate Countries
- To identify within a theoretically consistent framework the main drivers of farmland price formation
- To further develop the existing quantitative models to represent agricultural land, their markets and related policies in each of the EU member states.

Second period

- To derive a theoretically consistent present value model (PVM) for the selling price of farmland.
- To further develop the framework to identify the main drivers of farmland price formation
- To compare, on a theoretical basis, the impact on the selling price of land of alternative programmes of support to farmers (namely output price support and various forms of area-based payments, including the new CAP single farm payment system).
- To identify the role of land regulations (zoning, pre-emption rights, environmental regulations, etc.) as regards farmland price formation
- To compare our developed framework with the various versions of the PVM
- To model explicitly the impacts on the land rental price and the capitalisation ratio of the new CAP single farm payment (SFP) system.
- To compare, on a theoretical basis, the impact on the rental price of land and the capitalization ratio of the SFP relative to the previous direct payment system.
- To identify and analyse the linkages between farmland sale and rental markets
- To detect the main drivers of farmland price formation.
- To measure and compare the relative contribution of these main drivers to the farmland price formation.
- To measure and compare the extent to which different types of direct payments capitalize into farmland sale and rental prices
- To understand/analyse the capitalisation of support into land values (sales and rental prices), the distribution of this capitalisation among the different owners and the effect of the SPS (in combination with the institutional setting of land markets) on structural change in agriculture.
- To understand/analyse the reaction of land markets and asset values to changes in policy
- To further develop existing quantitative models to represent agricultural land, their markets and related policies in each of the EU member states
- To develop a data exchange between MAGNET & ESIM and farm/household models to simulate changes in the markets and policies for land use in agriculture.

3. A description of the main scientific results

Over the three-year duration of the project, research on **rural capital markets** in the EU and candidate countries resulted in the following main achievements.

In the first period of the project, the members of the Factor Markets Consortium identified and described the key issues, developments and institutions in the capital markets of the EU and candidate countries. Amongst other aspects, they investigated the key issues of farm capital structures, dynamics of investments, accumulation of farm capital, financial leverage and borrowing rates on farms in selected European countries. They developed a comprehensive conceptual framework for analysing capital markets and conducted a comprehensive literature review leading to a discussion and systematization of the determinants of financial capital use.

They carried-out several types of analyses: a cross-country analysis of capital markets in agriculture based on the concept of the shadow price of capital; an analysis of the impact of farm access to credit on farm input allocation and farm efficiency in the New Member States which leads to a better understanding of capital markets and their effects on structural change and investment; a theoretical analysis of the interaction of CAP payments, credit constraints and vertical integration; and an analysis of farm ownership (equity financing) specifics in New Member States, in particular in the Czech Republic.

Finally, the members of the Factor Markets Consortium also further developed the quantitative models MAGNET and ESIM in order to better represent capital markets and related policies in each of the EU member states.

In the second period of the project, the members of the Factor Markets Consortium identified the drivers of capital productivity in the EU agriculture. They also identified and investigated the determinants of farm-individual shadow prices of capital by estimating the relation to other economic or social variables at the farm level.

They carried-out several types of analyses. Firstly, they conducted an analysis of the investment behaviour EU arable crop farms in selected EU countries and an assessment of the impact of policy reforms. In this context, they completed a comparative analysis of the investment demand for farm buildings and machineries by arable crop farms in the following selected EU member states: France, Germany, Hungary, Italy and the United Kingdom. The analysis focused specifically the impact on investment of the different types and levels of CAP payments, allowing for the existence of uncertainty in the price of output farmers receive. Secondly, they carried out an analysis of the effects of economic factors and policies on the adoption of robotics in the dairy sector, with a particular focus on farm productivity. This analysis showed how capital-intensive technology has affected the overall productivity of milk production.

They also undertook a study on the European markets for equipments, with an emphasis on tractors. This study improved the understanding of the EU market for agricultural equipment. They empirically analysed the impacts of capital use on productivity in EU agriculture while at the same time developing a new method for agricultural productivity measurement. They assessed the impact of CAP subsidies on farm total factor productivity (TFP) in the EU and broaden their analysis by examining the drivers of productivity in EU agriculture from a factor markets perspective, and using econometric calculations carried out for a set of eight EU member states.

Finally, the members of the Factor Markets Consortium analysed how an improved access to capital affects agricultural production and consequently helps to reduce the pressure on land

use. They conducted a comparative analysis of simulation results which show that imperfections on credit markets have a strong impact on factor mobility and consequently on production and factor allocation in agriculture. They conducted an ex-ante policy impact assessment on elasticities of investments in buildings and machineries with respect to the Single Farm Payment provided to farmers after the 2005 and simulated several direct payment reform scenarios proposed by the European Commission in the debate on the post-2013 CAP reform. They provided an overview of the modelling and simulation results achieved in the capital market analysis.

A few key results of the Capital Market analysis undertaken under the Factor Markets Project

- Extensive results are provided on the imperfections which characterize rural capital markets and which affect both the supply and demand sides of capital markets. A crucial element is the heterogeneity of institutions influencing the functioning of capital markets across the EU and candidate countries; the differences in these institutions may lead to increasing disparities in economic development across Europe's rural areas.
- The elimination of imperfections is found to improve of the functioning of capital markets – making access to credit and funds easier, especially for small-scale farms and for rural development.
- Different types of indicators have been developed: indicators to estimate the performance of the credit market institutions, indicators to measure the level of integration of rural capital markets in the wider capital markets and performance indicators to measure the long-term financial stability of the agricultural sector.
- In the case of Czech corporate farms, significant differences are found in the level of investment activity, responsiveness to market signals, investment lumpiness, as well as investment sensitivity to financial variables among farms with different ownership characteristics.
- An important issue is the interaction between CAP payments, credit constraints and farm investments. Some key results suggest that farm investment decisions may be affected by the nature of the subsidies: coupled payments stimulate farm investments, but decoupled payments may not affect investment decisions.
- Considering different policy scenarios, the investment in machinery and equipment are predicted to improve in several Member States following the reduction in support levels induced by the policy scenarios considered. Moreover, investments in new technology as well as investment aids to boost up investments are needed in low-productivity areas where such investments still have a great potential to increase productivity
- In addition to the demand effects of subsidies, a supply effect on the provision of rural finance is also found. Farms may use the SFP directly to pay for the farm activities and thus substitute for missing credit. Subsidies may also affect bank credit if future subsidies are used as collateral.
- Some other findings suggest that subsidies may have impacted negatively farm productivity in the period before decoupling; after decoupling, this effect seems to be more nuanced.
- A positive effect of subsidies on bank loans is observed, although this effect depends on the farm structure: large farms use subsidies to increase long-term loans, whereas small farms use subsidies to obtain short-term loans.

Over the three-year duration of the project, research on **rural labour markets** in the EU and candidate countries resulted in the following main achievements.

In the first period of the project, the members of the Factor Markets Consortium identified and described the key issues, developments and institutions of the labour markets of EU and candidate countries.

They also conducted an analysis of the drivers of rural labour, identifying and classifying the various limitations of rural labour markets from both supply and demand side and a preliminary empirical analysis of the drivers of labour use on farms in rural Poland.

Finally, the members of the Factor Markets Consortium developed a conceptual and theoretical framework to analyse labour markets in order to better understand the supply of labour in EU rural areas, focusing on household decision-making on off-farm labour allocation and on the theories underpinning farm labour and the impact of labour use. They further developed the quantitative models MAGNET and ESIM in order to better represent labour markets and related policies in each of the EU member states.

In the second period of the project, the members of the Factor Markets Consortium identified and analysed the factors affecting labour use on farms.

They also conducted several types of analyses: an analysis of the farm labour use determinants; an empirical analysis of off-farm labour decision in Italian regions; an empirical analysis of factors determining labour choices in rural Poland; an empirical analysis of how market conditions and agricultural policy (in the particular the CAP) affect out-farm migration. In particular; an analysis of the determinants to leave agriculture and change occupational sector; an analysis of the determinants to exit from agriculture under the conditions of CAP payments in four selected EU countries; a review of the key mechanisms that affect the process of off-farm labour reallocation during the process of economic development and its relationship with the evolution of the relative income gap (between the agricultural and non-agricultural sectors); the study of the effects of CAP policies on out-farm migration across 150 EU regions over the 1990-2009 period.

Finally the members of the Factor Markets Consortium developed labour market modelling in MAGNET, scenarios and ex-ante policy analyses on old and new Member States on labour market responses to reductions in the first pillar of the CAP. They provided an overview of the modelling and simulation results achieved in the labour market analysis.

A few key results of the Labour Market analysis undertaken under the Factor Markets project:

- The structure, institutional framework and functioning of the agricultural labour markets across the EU and candidate countries are highly heterogeneous. One commonality across Europe has been the increasing labour outflow despite high levels of agricultural subsidies.
- Given that the incidence of off-farm employment by farmers and their families is an important determinant of future structural change within the agricultural sector, future productivity levels and the efficient use of the other factors of production, it is crucial to understand what determines inter-sectoral relocation of workers and off-farm employment and to what extent policies, including the CAP, affect this process. The determinants to leave the agricultural sector are also highly different across member states and candidate countries. Some results indicate that younger individuals are more likely to leave farming activities, although the largest outflows of agricultural labour are mainly associated with the retirement of people. Self-employed and family workers are generally less likely to

leave agriculture and low levels of education constrain entering the non-farm economy. Labour market conditions at the regional level matter. Differences among the selected new member states and the EU-15 can be explained by the diverse production structures, suggesting different capacities to release and absorb labour.

- The studies of the impact of CAP subsidies on agricultural labour provide conflicting results; CAP payments contributed to maintaining jobs in agriculture, but this effect is found to be rather small. The precise effects also vary across different types of CAP payments, with Pillar I subsidies having a larger effect than Pillar II payments.
- In Greece, family and hired labour are found to be substitutes rather than complements, while agricultural support measures appear to negatively affect both family and hired labour demand. Also, subsidies for rural development do not seem to favour on-farm labour use. Structural labour adjustments are also affected by farm size and location.
- An interesting explanation is also provided for why the impact of agricultural subsidies on employment may be small or sometimes even negative. The aggregate effect is the result of two opposing sub-effects: a short-term positive income effect (enhancing employment) and a longer-term positive effect on education (by reducing credit constraints), which leads to a reduction of labour in the longer term.
- Results on the supply of labour are also provided: the impact of decoupling (of CAP subsidies) on off-farm labour supply may be dependent on a relative wage effect and a wealth effect. The decline in the farm wage relative to the off-farm wage makes off-farm work more attractive, thus producing the relative wage effect. At the same time, decoupled direct payment provide a new non-labour source of income thereby generating a wealth effect, reducing labour supply. Moreover, the supply of labour is found to be responsive to changes in the real wage in the medium term as higher wages increase the opportunity cost of being economically inactive and induce people to enter the labour force, while lower wages reduce the opportunity cost and lead to lower participation rates.
- Other results document the productivity gap between the agricultural and non-agricultural sectors by studying the interactions between off-farm labour migration, transfer frictions and the persistency of income gaps.
- Finally, key results are provided on the effects of combining on-farm and off-farm activities (i.e diversification). In Poland, returns from diversification improved after the accession of Poland to the EU. Other results suggest that diversification (also called pluri-activity) can sometimes merely be a survival strategy (allowing non-profitable farms to survive) but does not necessarily guarantee the long-term sustainability of farming.

Over the three year duration of the project, research on **rural land markets** in the EU and candidate countries resulted in the following main achievements:

In the first period of the project, the members of the Factor Markets Consortium identified and described the key issues, developments and institution in the sales and rental markets of agricultural land in the EU and the three candidate countries.

They also conducted several analyses: an analysis of the drivers of land values, based on a literature review on the determinants of land prices and a preliminary assessment of the determinants of land prices and land use through several case studies; a meta-regression analysis on the existing literature to investigate the influence of different measures of government support on land prices; and a preliminary empirical analysis of the impact of changes in agricultural policy on the land market in Italy (leading to a better understanding of the interaction between CAP payments and the EU land market).

Finally, the members of the Factor Markets Consortium further developed the quantitative models MAGNET and ESIM in order to better represent land markets and related policies in each of the EU member states.

In the second period of the project, the members of the Factor Markets Consortium conducted a comprehensive review of the instrumental uses of farmland prices.

They developed a theoretical land rent model, to assess the impact of price support before the MacSharry reform, the area payments implemented from 1992 onwards and the Single Farm Payments (SFP), and they developed another theoretical model to analyze the impact of SPS implementation in a static and dynamic framework. They also developed a land regulatory index for land regulations in the EU to highlight the huge heterogeneity of situations.

They conducted several types of analyses: an analysis of the effects of the Single Payment Scheme (SPS) with and without farm structural change; an empirical analysis on the main drivers and factors affecting land markets and land prices; an analysis of the main drivers of farmland price formation in France; an empirical analysis of the factors influencing land prices in Bavaria; an empirical analysis of the factors determining land sales and land rentals in Poland; an analysis of the effect of land fragmentation on farm performance with an application to the French region Brittany; an empirical analysis of the relationship between land demand, labour availability and its cost, and the regionalised component of direct payments.

Finally, the members of the Factor Markets Consortium carried out different policy impact assessments. In particular, they studied the distribution effects of the CAP in Slovakia, the impact of the SFP system on French and Italian farmland prices, the impact of land use on policy rent distribution in selected EU member states, the impact of the shift from historical to regionalised payments on land demand and they completed a comparative analysis of the reaction of land markets and asset values to changes in policies. In terms of modelling, they extended MAGNET to analyse land supply and land availability for agriculture and provided an overview of the simulation and modelling results of the land market analysis of the factor markets project.

A few key Factor Markets results achieved under the land market analyses of the project:

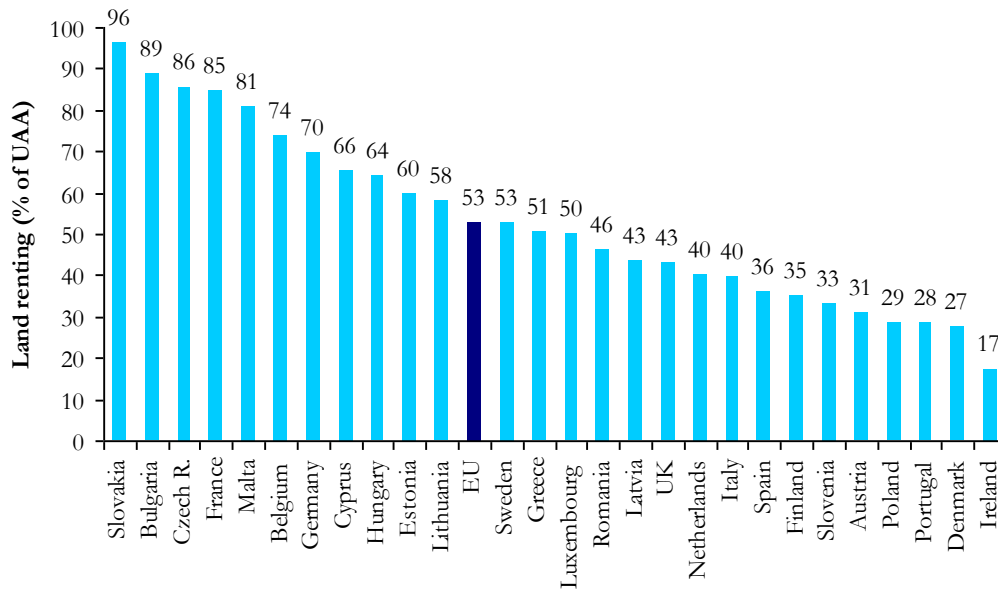
- Several studies in the Factor Markets project analyse the impacts of agricultural policies on land markets both from a theoretical and an empirical perspective.
- Based on an overview of the determinants of agricultural land prices and the effects of government support policies, results show that a considerable part of farm subsidies is captured by initial owners of land instead of operating farmers, but that the estimation techniques used in these calculations do have a significant influence on capitalization estimates for different support measures.
- Looking at the impact of the Single Payment Scheme (SPS) under different policy regimes, results show that it has different impacts on farm restructuring and income distributional effects: farmers' benefits can range from 100% of the SPS value to a negative policy incidence, and farm structural change may also be hindered by the SPS.
- Different CAP support measures have different impacts on land rents and land allocation, but they all seem to favour land of higher quality (productivity).
- Specific results on the impact of the CAP direct payments on land rents in New Member States show that up to 25% of these payments were capitalized in land rents at the time of

EU accession. These results also show that this capitalization rate is higher in more credit-constrained markets, which implied that the functioning of other markets (in particular rural credit markets) affect access to land, farm structural change and also the distributional effects of agricultural subsidies.

- In the case of Italy, some results also show that the potential impact of the new CAP measures (after the 2013 reform) would be an increase in rental prices (due to the shift from historical payments to regional payments and a tendency to re-allocate land).
- Interesting results on the impact of land regulations on land markets are also provided, and a Land regulation index has been developed to illustrate the large differences among member states.
- In the case of France, the impact of these land regulations on the capitalization of agricultural subsidies is studied in relation to CAP subsidies and results show that the capitalization rate depends on the type of region and the type of regulation that is considered.
- Specific regulations - environmental regulations (and in particular de/re-forestation policies) – are considered as well, and indicate different results on the impact they have on land use (in some cases, these regulations extend agricultural land use, sometimes they reduce it)
- Finally, the impact of other – non-economic factors – on land markets is also examined; in particular social factors, such as social comparisons (and the concept of relative deprivation) may motivate farmers to engage in land acquisitions.

In summary, the capital, labour and land market analyses undertaken during the first reporting period already substantially contributed to a better understanding of rural factor markets in the EU and candidate countries. More specifically, the consortium of the Factor Markets project investigated the functioning of rural capital markets, their interactions with the CAP, as well as their effect on structural change and investment. The partners explored labour supply decision-making and labour allocation in rural areas, and have assessed the impacts of policy on land markets, especially in relation to the CAP. Building on the results achieved during the first reporting period, the capital, labour and land market analyses undertaken during the second period further contributed to a better understanding of rural factor markets in the EU and candidate countries, by investigating the drivers and impact of each factor use, conducting empirical analyses on various aspects of the rural factor markets and finally carrying out policy impact simulations, which are highly relevant for the on-going and future EU decision-making on the EU's CAP. More details on the impact of the project results are provided in the following section.

A general conclusion that can be drawn from the Factor Markets project is that all rural factor markets in the EU and candidate countries are characterized by heterogeneity, albeit a *Common* Agricultural Policy and an integrated EU market. As an illustration of the variations in factor markets and their governance, Figure 1 (below) shows the remarkable variety of situations in the EU, with respect to the share of rented land in agricultural land use. While the EU average is close to 50%, the share of rented land varies from around 10% to around 90%. Interestingly, there is no East-West divide since the variations appear to be equally large in Western member states as in the Eastern member states. In addition, there are major differences in land regulations. These differences can have major implications for structural change and productivity, for income distribution and for the impacts of the CAP, with most of the subsidies linked to land.



Another general conclusion on rural factor markets is the fact that these markets play a significant role for productivity growth and are of crucial importance in designing strategies to improve the sustainability and competitiveness of the EU farm sector in the long-run. Interestingly, some of the project results suggest that the CAP has not always been in favour of farm-productivity; subsidies are found to have had a negative impact on farm productivity in the period before the decoupling reform was implemented. After decoupling the effect of subsidies on productivity became positive in several countries.

4. The potential impact (including the socio-economic impact and the wider societal implications of the project so far) and the main dissemination activities and exploitation of results

4.1 Impact

The results of this project contributed to a better understanding of the fundamental economic factors affecting EU agriculture that could potentially allow for better targeting of CAP measures with the aim of improving the competitiveness of the sector. In particular, the project contributed to the existing literature on rural factor markets along two dimensions:

- (a) A comparative approach across the Member States and Candidate Countries; and
- (b) An in-depth analysis of key issues determining the functioning and impact of each of the factor markets for agriculture and rural economies.

In this sense, the results of this project provide crucial and timely evidence, in the light of current and future reforms of the CAP and the fundamental transformations European rural areas are undergoing.

In what follows the final output for the three different factor markets analyses is provided.

In addition to collecting and processing information to develop a comparative analysis of rural capital markets, the Factor Markets project made a significant contribution on several aspects and issues related to EU rural capital markets:

- Analyse supply constraints in EU rural finance. In order to understand the drivers and impacts of the supply side constraints of rural capital in the EU, the Factor Markets project empirically investigated the causes and impacts of credit constraints in agriculture across the EU member states.
- Study the demand side of rural capital markets and how its characteristics affect farm investment. The Factor Markets project analysed farm investment decisions by considering that, while making their production and investment choices, farms face uncertainty and part of the investment is sunk.
- In order to have a good understanding of these capital markets and their effects on structural change and investment, as well as the interaction with the CAP the Factor Markets project accounted for the farm heterogeneity in the EU-27, not just in terms of structure, size and productivity but also in terms of financial structure.
- To understand the functioning of the EU rural capital markets and its effects, the Factor Markets project contributed to a better understanding of the extent to which (rural) capital markets are integrated across the EU.
- Another contribution of the Factor Markets project in this area was an extensive study of the role of factor complementarity for farm investment in EU agriculture.
- Theoretical and empirical analysis was also undertaken to examine the interaction between CAP payments, credit constraints and farm investments.
- In addition to studying the direct effects of subsidies and horizontal market integration across the EU, the Factor Markets project contributed by investigating the relationship between farm credit, subsidies, and vertical integration in the EU.
- For the Factor Markets project, a set of existing models of European agriculture (MAGNET and ESIM) were further developed as a major integrative and innovative component of the study.

In summary, some key achievements of the capital market analysis are the provision of new insights and new results on credit market imperfections in agriculture, on the differences in the institutional characteristics of these markets across the EU and candidate countries, but also on the internal financial structure and management organization of farms, for example in particular on the relationship between capital ownership and investment behaviour. Other key results contributed to a better understanding of the interaction between CAP payments, credit constraints and farm investments, but also of the impact of CAP subsidies on bank loans, and more broadly on the productivity of EU farms.

For the past century there has been an important restructuring of the economies in Europe and with it a reallocation of labour and other factors. An important element of this has been an outflow of labour from agriculture. The creation of the EU and the introduction of the CAP has affected this process but not halted it. In this process, the functioning of rural labour markets is extremely important as the latter will determine the allocation of labour across different economic activities, and as such, affect rural incomes and development. The integration of rural areas in general labour markets can contribute importantly to rural household incomes and to the competitiveness of farms and the agricultural sector as a whole. However, studies also show that, in many regions, such markets do not work perfectly and,

moreover, that it is crucial to take into account local labour market institutions, variations in household characteristics, etc. in order to get a good understanding of the functioning and the constraints in these rural labour markets.

Hence, in addition to collecting and processing information to develop a comparative analysis of rural labour markets, the Factor Markets provided new insights on several aspects and issues related to EU rural labour markets:

- In order to understand the supply of labour in EU rural areas the Factor Markets project developed a collective household model to model the labour supply decision-making.
- The model was further developed to take into account the importance for home production in rural households in their labour supply decisions.
- The Factor Markets project also carefully modeled the role of off-farm employment as many households in rural areas allocate labour to activities on and off the farm.
- Another issue that the Factor Markets project focused on was the role of “non-income factors” in determining inter-sectoral labour reallocation.
- In order to understand the functioning of rural labour markets in the EU, and especially in some regions, the Factor Markets project explicitly took into account labour market imperfections and transaction costs.
- To correctly measure the adjustments in rural labour markets, the Factor Markets project explicitly accounted for differences in effective labour costs and productivity between family labour and hired workers.
- For the Factor Markets project, a set of existing models of European agriculture (MAGNET and ESIM) were further developed as a major integrative and innovative component of the study.

In summary, some key achievements of the labour market analysis were the provision of new insights and new results on the imperfections of labour markets in agriculture, the differences in institutional characteristics regulating these markets across the EU and candidate countries, and on the international functioning of rural households. These new insights contributed to a better understanding of the constraints and conditions these markets work under. The supply of agricultural labour and the factors determining the reallocation of labour (e.g. from farming activities to other sectors) were analysed in greater detail to understand the reasons behind the agricultural labour outflow under the CAP. The impact of farm subsidies on labour reallocation also provided some new evidence on the effects of this policy.

Rural land markets have always been, for obvious reasons, very important for EU agriculture. However, since the MacSharry reforms in the early 1990s, much of the CAP payments are linked to land use. The 2003 CAP reform reformed the payments but there is still an important link to the land markets. Therefore, given the importance of the relationship between CAP payments and land markets, an important focus of the Factor Markets project was put on understanding and predicting the impact of the SPS on rural land markets, including both sales and lease markets.

- The variety of land market regulations was taken into account. As all factor and commodity markets, the EU markets for agricultural land are subject to institutional regulations, both national and EU-wide. The land market regulations are extremely diverse across and between the EU Member States and Candidate Countries, as is the agricultural land itself. In order to fully understand their impact on land market outcomes, all key rural land market regulations were accounted for, both on land sales and rental markets.
- In order to correctly model policy impacts on land markets it is important to integrate both first and second order (direct and indirect) effects. The Factor Markets project contributed to the growing impact assessment literature by accounting for both direct and indirect impacts of CAP through induced adjustments on land markets.
- A key question is how to model and measure the impact of the Single Payment Scheme on the land markets. The Factor Markets project contributed to the existing literature with a particular focus on the impact of the SPS on land markets.
- Studying the interaction between CAP payments and the EU land market allowed to draw conclusions on the differential impact in terms of capitalization between coupled and decoupled subsidies. The Factor Markets project shed light into the extent to which different farm support programmes (coupled and decoupled) are capitalised in farmland prices by measuring the impacts on land markets and prices of most important CAP measures which have been in force in the last two decades.
- For the Factor Markets project, a set of existing models of European agriculture (MAGNET and ESIM) were further developed as a major integrative and innovative component of the study.

In summary, some key achievements of the land market analysis are the provision of new insights and new results on the interaction between agricultural policies and land markets across the EU and candidate countries, both theoretically and empirically. Important policy conclusions can be drawn from the results of the project. Different types of CAP payments were analysed in relation to farm land prices, land sales markets and rental markets. Some results indicate for example that the different types of direct payments (before and after decoupling) all favour of land with higher productivity, but have different distributional effects and different capitalization rates.

4.2 Dissemination and exploitation of results

To disseminate the Factor Markets results and achieve the expected socio-economic impact, the Consortium relied upon several communication channels:

- Dissemination events
- Dissemination material

The project was punctuated by several important meetings along its three-year duration.

1. Project Kick-off meeting, 21-22 October 2010, Brussels, CEPS

The Factor Markets project was officially launched and the members were welcomed by Prof. Jo Swinnen, coordinator of the project, at CEPS – the Centre for European Policy Studies. The first day of the meeting enabled the Factor Markets partners to get to know each other better and, above all, to have an exchange of views and debate about the different elements related to the framework of the project and work-package structure. This day ended with a keynote speech given by Dr. Tassos Haniotis, Director, DG AGRI, European Commission, on the future of the CAP. The meeting continued the following day to discuss organisation issues and the first steps of the planned research.

2. Land Market Workshop, 23-24 May 2011, INRA-Agrocampus SMART (INRA), Rennes, France

The land market workshop was organized in Rennes (France), by the INRA team of the Factor Markets Project on 23-24 May 2011. This 1,5 day workshop included presentations by external persons to the project (Karen Macours of Paris School of Economics and Jean Cavailles of INRA Dijon), and by members of the project working on the Land Market analysis. Presentations by members of the FM project focused on current or past research on land market issues outside the FM project, and on the progress made towards completion of the project objectives. The aim of the workshop was to share ideas on the topic of land market functioning and on agricultural land prices and its determinants, and to provide suggestions on how to best achieve the objectives of the project.

3. 1st Factor Markets Workshop, 18-19 October 2011, Palazzo Feltrinelly (University of Milan), Gargnano (Brescia), Italy

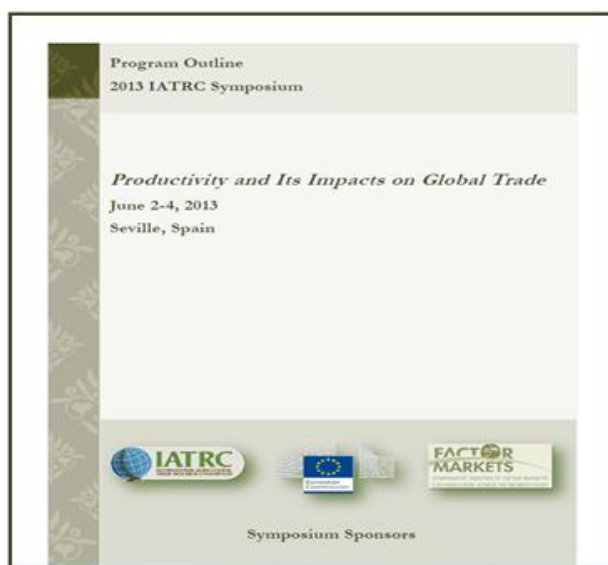
The Factor Markets project organised its first workshop in Italy at the University of Milan. The two days meeting enabled the Factor Markets partners to assess work progress and to elaborate on the methodology. A number of presentations on the Factor Markets publications were organised in three sessions on: Land, Labour and Capital Markets; whereas all partners expressed their views in terms of deliverable commitments and their plans on the future steps of the planned research, discussing also cross-cutting issues in parallel sessions. This event ended with a concluding session during which all organization and administrative matters were discussed.

4. 2nd Factor Markets Workshop in Ljubljana, Slovenia, 25-26 September 2012

On Tuesday 25 September 2012 and Wednesday 26 September 2012, the members of the Factor Markets Project joined in Ljubljana (Slovenia) to share research results and exchange views on the work performed so far. It gave them the opportunity to plan the next steps towards full completion of the project's objectives. After the opening and the introductory session of the Workshop, the discussions were structured in three sessions: capital market analysis, labour market analysis, land market analysis. The workshop ended with a discussion on the communication and dissemination strategy of the project and with the scientific steering committee meeting.

5. Final Factor Markets Conference in Sevilla, Spain, 2nd – 4th June 2013

Between the 2nd and the 4th June 2013, the final conference of the Factor Markets project was jointly organised with the International Agricultural Trade Research Consortium (IATRC) on the occasion of its 2013 Symposium, and with the European Commission. This joint event proved highly successful from a dissemination point of view, as the final results of the project were presented to key members of the agricultural research and decision-making community. The focus of this joint conference was put on agricultural productivity. The enhancement of agricultural productivity – through research and a better understanding of rural factor markets – has been an overarching objective of the Factor Markets Project.



6. Relevant policy discussions organised at CEPS, Brussels

- **20 June 2011:** A Europe without farmers? Agricultural Policy in an Experience Economy (Jo Swinnen (CEPS), Jean-François Hulot (DG AGRI), David Harvey (Journal of Agricultural Economics))
- **5 October 2011:** Launch of OECD Report on Evaluation of Agricultural Policy Reforms in the European Union (Jo Swinnen (CEPS), Ken Ash, Frank van Tongeren, Catherine Moreddu (OECD))
- **21 November 2011:** High Level Lecture on Food Security and Development (Jo Swinnen (CEPS), Sheggen Fan (IFPRI), Dacian Ciolos (Commissioner for Agriculture and Rural Development))
- **7 December 2011:** CAP reform proposals: implications for trade, development and the environment (Jo Swinnen (CEPS), Alan Matthews (ICTSD – Trinity College Dublin), Stefan Tangermann (ICTSD – University of Göttingen), Tassos Haniotis (DG AGRI), Shelby Matthews (COPA-COGECA), Ariel Brunner (BirdLife International))
- **22 March 2012:** The European Parliament and CAP reform 2013: How will co-decision affect the outcome? (Jo Swinnen (CEPS), Christophe Crombez (KU Leuven, Stanford University), Bas Eickhout (European Parliament), Tomas Garcia-Azcarate (DG AGRI))

- **19 September 2012:** OECD Report Launch: monitoring and evaluation of agricultural policies, CEPS, Brussels, with Johan Swinnen (KUL, CEPS), Carmel Cahill, Catherine Moreddu & Václav Vojtech (OECD)
- **26 November 2012:** Liberalization of Planting Rights: What future for the EU wine sector? CEPS, Brussels, with Johan Swinnen, (KUL, CEPS), Davide Gaeta (University of Verona), Pasquale De Meo (National confederation for voluntary consortia for the oversight of denominations of origin, Italy), Daniela Ida Zandonà, (European Federation of Origin Wines), Josè Ramon Fernandez, (Comité Européen des Entreprises Vins)
- **30 April 2013:** Food and Nutrition Security: we must walk the Talk! Launch of IFPRI 2012 Global Food Policy Report, with Shenggen Fan (IFPRI), Luc Christiaensen (World Bank), Tassos Haniotis (European Commission, DG AGRI), Johan Swinnen (KUL, CEPS)
- **15 May 2013:** Sowing the seeds of future growth for European agriculture, Wednesday 15 May 2013, CEPS, Brussels, with Irish Agricultural Minister Simon Coveney.
- **27 September 2013:** Food Security and Sociopolitical Stability: Book launch, Friday 27 September 2013; with Chris Barrett (Cornell University), Nathalie Francken (KUL, CEPS), Luc Christiaensen (World Bank), Johan Swinnen (KUL, CEPS)

The project consortium also developed and made use of different types of dissemination material:

- A website - www.factormarkets.eu launched in September 2010 and which will remain online beyond the end-date of the project
- A special publication series – the Factor Markets Working Papers. In total 68 working papers have been published
- Newsletters
- A Brochure
- A Flyer and a Logo
- A Final Book





All the working papers and deliverables, and other relevant documents such as newsletters, information about the participating institutes and the overarching project objectives can be found and downloaded from the **Factor Markets website**. Thanks to its user-friendly and interactive character, the website serves as a useful dissemination tool to communicate on the progress of the project and the main results achieved throughout the process. Apart from general information, the partners can also access a protected Members Area where minutes of meetings can be found, alongside other FM administrative documents (e.g. DoW, the Grant Agreement, etc.).

Apart from the project website, CEPS relies on other tools to ensure the widest dissemination possible: a Newsletter, a brochure, a leaflet, and a special series on two major scientific platforms: RePec/IDEAS (<http://repec.org/>) and AgEcon Search (<http://ageconsearch.umn.edu/>).

Four **Newsletters** have been circulated, at regular intervals, to communicate on the on-going progress of the project and the already-achieved results.

FACTOR MARKETS

Comparative Analysis of Factor Markets for Agriculture across the Member States

245123-FP7-KBBE-2009-3

NEWSLETTER

April 2013
Issue 4

Factor Markets publications

A publications series was launched on September 2011: the Factor Markets Working Papers. Since the last Newsletter in September 2012, the following working papers have been published:

- The Labour Allocation Decision of Farm Households: Defining a Theoretical Model, *Trevor Donnellan and Thia Hennessy* [FM WP No 31]
- Effects of Economic Factors on Adoption of Robotics and Consequences of Automation for Productivity Growth of Dairy Farms, *Anna-Mija Heikkilä, Sami Myyrä and Kyösti Pietola* [FM WP No 32]
- Agricultural Credit Market Institutions: A comparison of Selected European Countries, *Kristina Hedman Jansson, Chelsey Jo Huisman, Carl Johan Lagerkvist, Ewa Rabinowicz* [FM WP No 33]
- Identifying Factor Productivity from Micro-data: The case of EU agriculture, *Martin Petrick, Mathias Kloss* [FM WP No 34]
- The Market for Tractors in the EU: Price Differences and Convergence, *Christian Jörgensen and Morten Persson* [FM WP No 35]
- Patterns and Determinants of Off-Farm Migration:

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More working papers will be published during the following months.

A book will also be published to present the final results of the Factor Markets Project.

Factor Markets publications

Free download at:
www.factormarkets.eu

In total, **68 Working Papers** under the Factor Markets Special Publication Series have been disseminated through RePec/IDEAS and AgEcon Search, as well as through:

- the CEPS website <http://www.ceps.eu/project/comparative-analysis-factor-markets-agriculture-across-member-states-factor-markets>
- and the Factor Markets website: <http://www.factormarkets.eu/publications>

A full list of publications is provided in Annex I.

The **brochure** of the FM project is available under <http://www.factormarkets.eu/content/dissemination-material-n>

This 16 page document provides a summary of the project objectives, its target audience, the expected outputs and impacts, the presentation of the consortium, etc.

The **FM leaflet** is available under and is a useful document to advertise the FM project easily:
<http://www.factormarkets.eu/content/factor-markets-leaflet>



Finally, to complete the dissemination plan, as foreseen in Annex I, a **Final Book** “*Land, Labour and Capital Markets in European Agriculture: Diversity under a Common Policy*” has been edited by CEPS. This volume summarises the key findings and results of the project,

This book is composed of 29 chapters, structure in four parts. The full table of contents is provided in Annex 2.

- Introduction: Land, Labour and Capital Markets in European Agriculture: Diversity under a Common Policy
- Part 1: Land Markets
- Part 2: Labour Markets
- Part 3: Capital Markets
- Part 4: Factor Markets and Productivity



Land, Labour & Capital Markets in European Agriculture

Diversity under a Common Policy

**CE
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EUROPEAN
POLICY
STUDIES

Edited by
**Johan Swinnen
& Louise Knops**

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Annex 1: Full list of publications “Factor Markets Working Papers (FM WP)”

- [FM WP1] Land Markets in the EU Candidate Countries of Croatia, Former Yugoslav Republic of Macedonia and Turkey, *Štefan Bojnec*
- [FM WP2] The Penetration of Financial Instability in Agricultural Credit and Leveraging, *Kyösti Pietola, Sami Myyrä & Anna-Maija Heikkilä*
- [FM WP3] Productivity and Credit Constraints: Firm-Level Evidence from Propensity Score Matching, *Pavel Ciaian, Jan Falkowski, d’Artis Kancs & Jan Pokrivcak*
- [FM WP4] Do Agricultural Subsidies Crowd out or Stimulate Rural Credit Institutions? The Case of CAP Payments, *Pavel Ciaian, Jan Pokrivcak & Katarina Szegenyova*
- [FM WP5] Rural Labour Market Developments in the Former Yugoslav Republic of Macedonia, *Verica Janeska & Štefan Bojnec*
- [FM WP6] Agricultural and Rural Labour Markets in the EU Candidate Countries of Croatia, Former Yugoslav Republic of Macedonia and Turkey, *Štefan Bojnec*
- [FM WP7] Farm Level Capital: Capital Positions, Structures, the Dynamics of Farm Level Investments, Capital Accumulation and Leverage Positions, *Sami Myyrä, Kyösti Pietola & Anna-Maija Heikkilä*
- [FM WP8] Agricultural and Rural Capital Markets in the EU Candidate Countries: Croatia, Former Yugoslav Republic of Macedonia and Turkey, *Štefan Bojnec*
- [FM WP9] Agricultural and Rural Capital Market Developments in the Former Yugoslav Republic of Macedonia, *Biljana Angelova & Štefan Bojnec*
- [FM WP10] The Valuation of Agricultural Land and the Influence of Government Payments, *Paul Feichtinger & Klaus Salhofer*
- [FM WP11] Agricultural Land Market and Land Leasing in the Republic of Macedonia, *Neda Petroska Angelovska, Marija Ackovska & Štefan Bojnec*
- [FM WP12] Key Issues and Developments in Farmland Sales Markets in the EU Member States and Candidate Countries, *Pavel Ciaian, d’Artis Kancs, Jo Swinnen, Kristine Van Herck & Liesbet Vranken*
- [FM WP13] Key Issues and Developments in Farmland Rental Markets in EU Member States and Candidate Countries, *Pavel Ciaian, d’Artis Kancs, Jo Swinnen, Kristine Van Herck & Liesbet Vranken*
- [FM WP14] Sales Market Regulations for Agricultural Land in EU Member States and Candidate Countries, *Pavel Ciaian, d’Artis Kancs, Jo Swinnen, Kristine Van Herck & Liesbet Vranken*
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- [FM WP16] Institutional Factors Affecting Agricultural Land Markets, *Pavel Ciaian, d’Artis Kancs, Jo Swinnen, Kristine Van Herck & Liesbet Vranken*
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- [FM WP18] Drivers of Agricultural Physical Capital Development: Theoretical Framework and Hypotheses, *Karin Kataria, Jarmila Curtiss & Alfons Balmann*
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