

THE IMPLICATIONS FOR POLICY REFORM



Agricultural Support, Farm Land Values and Sectoral Adjustment

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Foreword

In most OECD countries, governments intervene in the agricultural sector through policies that both support and shape agricultural production. Farmers, as rational economic agents, incorporate the value of government support into their decision-making. This study seeks to identify policies that affect (or create) asset values in agriculture and to assess the extent to which the observed capitalisation phenomenon impede reform efforts and associated adjustments. It aims to provide timely and practical recommendations for successful policy reform based on the results.

The theoretical basis for asset capitalisation is presented in Chapter 2 that highlights the role of two key elasticities, and illustrates this with an example using the OECD's Policy Evaluation Model (PEM). Chapter 3 discusses the attempts by researchers to connect land rents and land prices empirically and theoretically, and highlights econometric estimates of changes in rental rates for land. Chapter 4 discusses policies both within and outside the agricultural sector with respect to their implications for asset values and asset mobility. Chapter 5 concludes by placing the effects of agricultural and other policies on land in the context of policy reform. It identifies the pros and cons of policy capitalisation and the policies most likely to lead to it, considers the implications for policy reform and provides advice for policy reform that is pro-adjustment, equitable, and welfare improving.

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Executive Summary

Governments intervene in the agricultural sector through policies that both support and shape agricultural production. This leads to two important outcomes. First, agriculture specific programs intended to increase the welfare of farmers - whether through commodity prices, input subsidies, or direct cash transfers – can become capitalised into asset values. These higher asset values translate to increased wealth for current sector participants, but the resulting higher cost structure can have deleterious effects. Second, many policies, in particular regulatory ones, reduce asset mobility –the ease with which capital, land, labour and other inputs are transferred between different economic activities. This results in reduced economic efficiency due a sub-optimal allocation of resources, and can potentially further exacerbate the capitalisation phenomena.

This study focuses on the capitalisation of government support into land rents and prices (hereafter referred to collectively as values). Capitalisation occurs when farmers, as rational economic agents, incorporate the value of government support into their decision-making. As a result, the value of assets used in agricultural production will reflect expected future benefits to the extent that eligibility is tied to the ownership or operation of these assets. Previous work at OECD shows that over time the capitalisation of support into the price of land and other assets is a major source of inefficiency in transfers to agriculture.

The degree to which support is capitalized into land rents can be described using basic economic theory. It is a function of three main factors: i) how the policy is implemented, specifically its initial incidence (targeted to land, inputs or labour); ii) the ease which land can be shifted to alternative uses (the elasticity of supply); and iii) the ease with which land can be substituted with other factors of production (the elasticity of substitution).

The theoretical foundations for asset capitalisation date back to at least 1815 when the famous economist David Ricardo noted that the price for land is closely related to the rents that it can generate now and in the future. Under this theory, land is both a production factor and an asset whose value responds to future economic returns. Support policies in favour of agriculture may be expected to affect both of these aspects.

Analysis using the PEM model shows that the capitalisation of support into land rents tends to be inversely related to the degree of market distortion. A more decoupled program is less likely to affect production decisions, but its benefits are more likely to be capitalised into land. This analysis relies on a number of standard assumptions, the most important related to the actual values used for the elasticities, and that all other factors outside agriculture are held constant.

Land rents can be related to land prices using the Net Present Value (NPV) framework. The cash rents derived from land reflect the current (single period) net value derived from its productive use. The price of land, in contrast, represents the benefits derived from present and future use of land. In spite of some well-known limitations, the NPV framework (with various extensions mainly to account for expectations and uncertainty) continues to provide the basis for the majority of empirical studies.

While most studies find that land prices and rents are positively correlated to government support, the magnitude of the response varies across studies. The studies reviewed show consistently that capitalisation of farm support is partial. This may reflect the perception of uncertainty with respect to future government support. It might also be due to requirements that often accompany farm programs, such as set-aside and cross-compliance.

Direct government support to the agriculture sector is not the only important factor that determines land values. Other factors, some of which are not related to agriculture (and that are outside the scope of this study), may also be important. An example is the impact of urban pressure on agricultural land, which can vary greatly depending on the country and the exact geographical location within a country. Nevertheless, a range of other policies, principally rules and regulations related to the use and transfer of agricultural assets, are also important factors. A number of case study countries (Japan, Korea, France, Mexico and Norway) illustrate in greater detail the diversity of such policies in OECD countries.

Beyond the country case studies, information obtained from government documents and other sources shows that in many cases, OECD countries apply some form of preferential treatment to agriculture. On the other hand, some countries have few policies that differentiate agriculture from non-agricultural activities

Nevertheless, it is clear that where policies exist that either directly support agriculture activities or indirectly give favourable treatment to agriculture vis-à-vis other sectors, the benefits may be capitalised into the value of agricultural assets. Land, often the least mobile asset in agriculture, can become more expensive to purchase or rent.

What are the consequences of inflated asset values? Inflated asset values reduce economic efficiency. Farmers must finance a higher initial investment and face the risk that future policy changes may affect the return on that investment. This creates a barrier to entry for potential new farmers, and increases the cost of expansion for existing farmers. Consequently, the mobility of assets between different owners is reduced, further contributing to higher cost of production in the agriculture sector.

Inflated asset values create two fundamental problems. First, the benefits of support in terms of capitalization only accrue to those who are asset owners at the time support was introduced. Later entrants receive no benefits, irrespective of whether they are tenants or new farmers who have purchased assets at higher prices.

Second, future reform efforts to reduce support are rendered more difficult because of the potential impact on asset values. Expectations about the level of government support in the future play an important role in the determination of asset values. When policies become capitalized into asset values, existing asset owners have vested interests, and may therefore resist future policy reform. Moreover new entrants, who must now pay a higher price that reflects government support, do not receive any of the benefits but also have an interest in seeing that support maintained.

If future support is reduced or eliminated, the issue of compensation may arise. Where compensation is judged to be necessary, it should be provided in ways that avoid the capitalisation of the compensation payments. Effective targeting to those who are affected by reform is crucial to minimizing the potential for the payments to be capitalised. As argued in OECD (2006b), it is also important to make compensation payments limited in time. This is to prevent compensation from impeding adjustment, and reflects the positive effects of the adjustment process itself.

What are the lessons for future policy making? Recommendations can be made along four main lines:

- Do not introduce, if possible, new policies that result in capitalisation or reduce asset mobility. Where this is not possible, minimize the negative impact of such policies. Implement policies that are sufficiently well targeted, if possible, to only achieve the desired objective –this will at the same time minimize or eliminate the problem of capitalisation.
- Avoid open-ended payment schemes.
- Engage in policies that enhance asset mobility, either actively or passively by eliminating current measures that have reduced asset mobility, in ways that do not introduce speculative incentives. Regulations governing land use should be evaluated as to their benefits and costs.
- When implementing policy reforms that reduce support levels, compensation may be a necessary component of the package. However, if provided, it should be in a form that minimizes the capitalization of compensation payments. One way is to provide compensation directly to farmers (*e.g.* tied to labour). Compensation payments should be limited in time so that they do not become capitalised or impede timely adjustment.

Chapter 1.

Introduction

In most OECD countries, governments intervene in the agricultural sector through policies that both support and shape agricultural production. In addition to providing payments on several different bases (such as production, land area or farm income), governments regulate land use and changes in land use, specify restrictions based on environmental policy goals, and target support to such areas as rural development and rural landscapes. While these programs have many effects, intended or otherwise, two are important here. First, agriculture specific programs intended to positively affect the welfare of farmers through commodity prices, input costs, or direct cash transfers can become capitalized in asset values. These higher asset values translate to higher wealth for current sector participants, but the resulting higher cost structure for the sector can have deleterious effects. Second, many policies, in particular regulatory ones, have implications for asset mobility –the ease with which capital, land, labour and other inputs are transferred between different economic activities. In addition to influencing how land is used, these can also act to enhance or suppress the value of land, with a corresponding wealth effect.

Capitalization occurs when farmers, as rational economic agents, incorporate the value of government support into their decision-making. The market value of assets used in agricultural production will reflect expected future benefits to the extent that eligibility is tied to the ownership or operation of these assets. Regardless of the initial impact, over time the capitalisation of policy support into the price of land and other assets is a major source of inefficiency in transfers to agriculture (OECD 1998). By raising returns to fixed factors, agricultural policies benefit the owners of such assets at the time the policy is put in place. New participants must pay higher prices to enter the sector, and see no net benefit from existing policies, even if they stand to lose if those policies are eliminated. Moreover, in many countries a significant share of agricultural land is owned by non-farming landlords, who may benefit from agricultural policies even though they may not be the intended beneficiaries.

Other policies, ranging from legislation governing land use to inheritance laws and taxation, also influence asset values. Most countries have laws and policies in force that regulate the conditions under which land can be converted from agricultural to non-agricultural uses. Special tax treatment may apply for assets — capital, labour, land, inputs — if they are used for agricultural production. Inheritance laws often favour intergenerational transfers of assets within the same family. In general these policies reduce the mobility of assets between agriculture and other economic activities.

The capitalization of government support into asset values and the impact of government policy on asset mobility have important implications for the optimal design of future agricultural policy. Policy reform to reduce the level of support or its basis may

be resisted due to the vested interests created by existing policy. At the same time, the constraints on asset mobility imposed by government regulations may limit the ability of farmers and asset owners to adjust to changes in market conditions. This reduces the potential benefits of reform in general, and can cause increased economic hardship for some.

This study analyzes the implications of the effects of government support on asset values and asset mobility for policy reform. It aims to provide timely and practical recommendations for successful policy reform based on the results. The theoretical basis for asset capitalisation is presented in Chapter 2 that highlights the role of two key elasticities, and illustrates this with an example using the OECD's Policy Evaluation Model (PEM). Chapter 3 discusses the attempts by researchers to connect land rents and land prices empirically and theoretically, and highlights econometric estimates of changes in rental rates for land. Chapter 4 discusses policies both within and outside the agricultural sector with respect to their implications for asset values and asset mobility. Chapter 5 concludes by placing the effects of agricultural and other policies on land in the context of policy reform. It identifies the pros and cons of policy capitalisation and the policies most likely to lead to it, considers the implications for policy reform and provides advice for policy reform that is pro-adjustment, equitable, and welfare improving.

Chapter 2.

Theoretical Foundations for Asset Capitalisation

It is recognised that agricultural support can affect farmland markets. Understanding the mechanism through which these affects are felt is the first step in explaining and predicting the impacts of agricultural policies on land use and prices, determining who benefits and who loses from support policies and all the other information that good policy making requires. This section identifies the main assumptions and economic variables behind that mechanism according to economic theory.

The key relevant insight from economic theory is that the value of land is derived from the profits that are to be earned from its use. That is, the rent a user of land is willing to pay equals the value it adds to the production process, the same as would be true for any other factor of production. This was first elaborated by David Ricardo (1815) in what to this day remains the main theory of land rent. The price of land for purchase or sale is closely related to this rental rate, where the total value of the land is determined by the amount of rent it can generate now and in the future.

Under this theory, land is both a production factor and an asset whose value responds to future economic returns. Agricultural support policies may be expected to affect both of these aspects of land. The main mechanisms that underlie the impact of agricultural support on prices and farmland markets can be described using standard microeconomic theory (for example, Floyd, 1965). This approach, described in detail in Annex 1, demonstrates that market interactions between output and factor markets lead to the impacts of a policy being felt throughout the production system, regardless of the initial incidence of the policy (*i.e.* whether it is targeted at output or land). Despite this, the initial target of a policy can have a strong influence on the eventual distribution of the effects (and benefits) of a policy.

While the range of policy instruments that potentially have an impact on asset values is vast, the main theoretical insights can be drawn from considering only two: output price support and land subsidy. These two policies represent how policies can affect land values both directly and indirectly. They also reflect the actual evolution of agricultural policies in many OECD countries over the last decade, where output price support has been progressively replaced by direct payments tied to land in some fashion.

Support targeted at output will trigger an increase the level of production. To increase output requires increased use of inputs, including land. This increase in demand will lead to an increase in both the rental rate and quantity supplied of land used in agricultural production. How much the rental rate increases depends on the ease with which more land can be brought into production.¹ This responsiveness of land is measured with the elasticity of supply, which relates proportional changes in the rental rate to proportional changes in hectares. A low elasticity means that a large change in price is required to bring about a change in quantity. Consequently, increasing demand for land translates to

mainly higher rental rates for land without a great expansion in hectares. This results in the policy becoming relatively highly capitalised in land rental rates. This and the following results assume that there are no policies in place that regulate land prices directly.

Another economic factor that is central to determining the extent to which policies become capitalised is the elasticity of substitution. This measures the ease with which one factor of production may be substituted for another in the production process. When the ability to substitute factors is high, increases in the cost of one factor lead to a reduction in its use and an increase in the use of relatively inexpensive factors. In particular, if land is very inelastic in supply (that is, increases in demand for land lead to higher land rents), a high elasticity of substitution means that an increase in the desired level of output (motivated perhaps by policy) will mean that other factors will be predominantly used to increase output, *substituting* these for land in the production process. This mutes the effect of an increase in demand on land rents, and therefore the amount of capitalisation that would occur.

The elasticity of substitution is particularly important when the policy is directly targeted at a factor of production. In the case where a policy acts as a subsidy to land use, a higher elasticity of substitution will allow more land to be used because it becomes relatively cheaper, leading to a higher land rental rate and thus greater capitalisation.

In summary, economic theory indicates that agricultural policies may have an impact on land prices regardless of how they are implemented. The extent to which capitalisation occurs depends on:

- *The elasticity of supply for land.* How responsive land use is to rental rates depends on the availability and feasibility of alternatives. In particular, some policies may limit the uses to which land may be put, lowering the supply elasticity of that land.
- *The elasticity of substitution between land and other factors of production.* When other factors are readily substitutable for land, this limits the price impact of policies not targeted on land. Conversely, when policies are targeted at land, a high elasticity of substitution increases the degree of capitalisation.
- *The initial incidence of the policy.* Policies targeted at land use may be expected to have a greater impact on land rents.

Factor supply elasticities and substitution elasticities

Stylized approaches to studying land-based policies such as by Guyomard *et al.* (2004) and in this report do not capture all the elements of real-world programs in OECD countries. However, so long as markets operate reasonably effectively, the role of the economic concepts of supply and substitution elasticity will continue to be central to determining the effects of these policies. This section further elaborates the meaning of these elasticity parameters, and presents some empirical evidence with respect to their values.

Factor supply elasticities: indicators of factor mobility

Consider a landowner who owns all the land in a country and that the only possible use for land in this country is producing a single agricultural commodity. The landowner has little choice but to allocate all the land to the agricultural use. As there is no alternative use for this land, this decision will not depend on the land rental price. In other words, when there are no alternatives available the supply price elasticity of land must be at its lower bound of 0 (land supply is perfectly inelastic).

Now assume there are two alternative uses for land, either agriculture or something else. The landowner is now able to split available land between both uses so as to increase the profits earned from his land. As a result, the quantity of land supplied to the agricultural sector will now depend on the rental rate of farmland: an increase in this price, will lead the landowner to put more land in agricultural production. In other words, the presence of an alternative use implies the supply price elasticity of farmland is positive. Supply elasticity has to do with how many feasible alternatives are available to the owner of the land. What alternatives are available to a landowner in practice depends on the extent to which land is heterogeneous (suitable for alternative uses), and what laws are in place regarding land use and conversion. That is, the feasibility of alternative uses for land, and therefore its elasticity of supply in any specific use, depends on physical limitations and the policy environment.

Most countries have in place laws and policies that regulate the conditions under which landowners can convert land from agricultural to non-agricultural uses. For example OECD (1996) and Latruffe and Le Mouél (2006), show that in most OECD countries there are planning or zoning legislations that designate land as farmland, building land, etc., and there are laws that prevent conversion of land from its administratively designated use to alternative uses. This is particularly true for agricultural land which is highly protected from competing uses. The stricter the legislation that protects agricultural land from competing uses, the lower the degree of mobility of farmland between agriculture and other sectors and the lower the elasticity of supply of farmland. These policies are discussed in greater detail in Chapter 4.

How suitable land is for alternative uses and the restrictions placed upon it by policy remains relevant when considering the alternative uses of land within agriculture, if to a lesser degree.² Land already used in agriculture is more likely to be suitable for the production of an alternative agricultural commodity than it would be for an alternative non-agricultural use. This implies that it is likely that the elasticity of land supply to a specific crop is higher than the elasticity of land supply to the agricultural sector as a whole.

Reliable estimates of land supply elasticity have proven elusive (OECD, 2001). Nevertheless, in the absence of empirical estimates, there is a broad consensus in the academic community on a number of “stylized” facts concerning OECD countries.

- *The elasticity of land supply to the agricultural sector is very low.* Consequently, most global simulation models focused on agriculture assume no land mobility between agriculture and other sectors (*i.e.* zero elasticity).
- *Among all factors/inputs used in agriculture, land is likely to be the least mobile from agricultural to non-agricultural uses.* Hence at the sector level, agricultural land supply elasticity is probably lower than agricultural supply elasticities for all other factors/inputs.

- *Family labour is also likely to be relatively immobile between agriculture and other sectors, if more mobile than land.* That is, the supply elasticity of family labour is likely to be low, but higher than land.
- *All other factors/inputs are likely to be very mobile between agriculture and other sectors.* Consequently supplies of these other factors/inputs are often assumed in theoretical models and global simulation models to be perfectly elastic (this is not the case for PEM, which has elastic but finite responsiveness for these factors).³

The implications of this consensus view for the impact of agricultural policy on land value is evident considering the previous discussion on the role of factor supply elasticities. Specifically, for most OECD countries, it is likely that:

- A significant share of agricultural support is capitalised in the rental price of farmland;
- Family labour also benefits from agricultural support but to a lesser extent than land and particularly when support is provided through output price support instruments;
- When support is provided through a land subsidy a larger share of support is capitalised in the price of land while family labour benefits little if at all. The effect on the total welfare of farm households depends on the extent to which farm households own their own land.

Elasticities of substitution: indicators of the flexibility of technology

The elasticity of substitution between two factor/inputs measures indicates the proportional change in the use of a pair of factors for a given proportional change in their relative prices. It is defined for a cost-minimising producer, keeping constant the quantity of output produced. The definition of the elasticity of substitution is slightly different when generalizing from a two-factor/input framework to a n-factor/input framework. It is now a partial measure defined for pairs of factor/inputs -it measures the percentage change in the ratio of quantities of factor/input i and factor/input j used per percentage change in the ratio of their prices, holding constant all other factor/inputs. Therefore, in a n-factor/input framework, the elasticities of substitution do not represent the full degree of substitution possibilities available in any production technology.

In contrast to factor supply price elasticities, estimates for elasticities of substitution between factor/inputs used in agricultural production are widely available in the literature, even if these estimates do are not always in agreement. OECD (2001) provides an extensive review of available estimates of elasticities of substitution in agricultural production for Canada, the European Union, Mexico and the US. This review, the most comprehensive available in the literature, was carried out in the course of the development of the PEM model and used as the key input for parameter calibration.

According to this review, at the aggregate level:

- Broad categories of factor/inputs (mainly land, family labour, capital and purchased inputs, such as hired labour, fertilisers, pesticides, seeds, energy, etc.) are on average found to be substitutes rather than complements in production.
- Land is likely to be a stronger substitute to purchased inputs than to family labour and/or capital.

- Estimates vary across studies; different studies report estimates for pairs of factors ranging from strong substitutes to strong complements.

Quantitative analysis of agricultural support and land markets

All existing simulation models of agriculture, whether partial or general equilibrium may be considered to be more elaborated versions of the simple analysis presented here. They rely, implicitly or explicitly, on specified agricultural production functions and on supply functions of production factors resulting from optimisation behaviour of factor owners. These models are able to incorporate a greater number of commodities, sectors, and factors of production, allowing a more complete analysis.⁴ These models have proven useful in predicting the impact of agricultural policy reform, and can shed light on the relationship between agricultural policies and land markets and the implications of this relationship for policy reform.

The relevance of the results obtained from models is related to the validity of the assumptions that underline it. An important assumption is that of perfectly functioning markets. This may be a valid assumption for most developed economies, but is not true in cases where property rights and capital markets are not well defined. While this is an important limitation to keep in mind, in the context of the OECD, imperfect land markets only apply in a number of special cases, mentioned for example in Box 2.1. Rules and regulations that modify the mobility of assets between different uses may also play an important role -this will be discussed in Chapter 4.

As far as the analysis of asset values is concerned, another key limitation of most economic models is that they consider farmland a production factor and not as an asset. They may be able to tackle the question of the extent to which the value of support policies becomes built into rental prices of farmland, but cannot directly answer the question of the extent to which these policies are capitalised into farmland sale prices.

Inferring how changes in the rental rate can translate into changes in land price can be done following the basic Ricardian insight that land price can be expressed as a function of the net present value of the stream of future benefits that land provides. Determining this value depends on the degree to which future returns are discounted (that is, are less valued than current returns), the number of years where these returns are relevant, and the amount of uncertainty that exists regarding future returns, among other things. The details of this approach are discussed in the following chapter, as is the evidence supporting its use and practical measurement.

If all agricultural policy instruments used in OECD countries were explicit subsidies based on specific outputs, factors or inputs, modelling their first incidence would be straightforward, requiring only the appropriate level of disaggregation in outputs and factors/inputs. The difficulty is that agricultural policy instruments are increasingly more complex. Consider direct payment-type support. In this case, it is more appropriate to refer to a program rather than a single instrument since most direct payment programs used in OECD countries consist of several instruments. Some features particular to land-based policies that are relevant in evaluating their impacts are:

- Payments can be accompanied by a set of conditions such as mandatory set-aside, mandatory production (of possibly specific outputs), limited base area, being a farmer, and respecting environmental regulations.

- Not all farmland may be eligible for a program, leading to differences between eligible area and non-eligible area.
- Payments may not be connected to the production of a commodity at all, but made on the basis of past production or support. The difference between the historical area or amount must be reconciled with the impact on current production decisions.
- Conditions for area payments can include mandatory or voluntary set-aside. The key issue for mandatory set-aside is whether or not it applies to output specific land. The modelling issue is then whether the specification of the agricultural production function distinguishes land area that is subject to set-aside from land area that is out of the constraint.

An illustrative example using the OECD PEM

The OECD's Policy Evaluation Model (PEM) can be considered an application of the analytical framework described above.⁵ Similar in theoretical structure, it expands the analysis to six OECD regions, six different commodities, and a number of factors of production purchased and owned by the farm household. It also specifies the values of the elasticities (indirectly in some cases) that were shown to be crucial in determining the effect of policies on production and capitalisation. The model is used to illustrate the relationship between the design of agricultural policies and their impact on the rental rate of land. PEM is a static, partial equilibrium representation whose analytical strength for this purpose is its relatively detailed representation of the different types of land used in agricultural production.⁶

Land in the model is seen as a resource that is heterogeneous in nature; while a particular plot of land may be best suited in use for wheat production because of soil type and the combination of other physical characteristics such as location and length of growing season, for example, it could also be used to produce other commodities, if somewhat less efficiently. This heterogeneity is represented in practice through a series of cross-price elasticities for land that indicate how land will shift between alternative uses as the rental rate of land in those uses change. This assumption of heterogeneity implies that different land uses have different rental rates. This broadly reflects observed fact, but the origin of the heterogeneity, be it natural or policy based is not specified. As noted above, land heterogeneity is an important determinant of land supply elasticity.

Land is one of many factors of production, each of which may be substituted one for another to a certain extent. The effect of policies on land may then be analysed according to the two key elements identified earlier: the allocation of land among competing uses according to the relative rental rates of land in each (supply elasticity), and the trade-off between land and other factors of production of a specific commodity according to the relative price of each (elasticity of substitution).⁷

As described above, supply elasticity is a reflection of the available alternatives. Whether a farmer responds to a higher rental rate for land use to produce wheat depends on what is happening to the rent for other uses of the land. In the PEM, a policy may affect several of these rental rates simultaneously, depending on the breadth of the policy's application. As will be seen, it is the relative changes in these rental rates that matter in determining the optimal response. The results of the analysis are always understood with reference to two axes of effect: i) how the policy affects the relative rental rates of land, and thereby the supply of any particular land use, and ii) how the

policy affects the relative costs of using different factors of production, in particular the relative cost of land versus other factors.

Because of the nature of the model used, policy experiments estimate the impacts of agricultural policies in isolation from any other factors influencing the use or price of land already in agricultural production. That is, the analysis is limited to the agricultural policies that are explicitly represented; all other factors are assumed to remain constant. That said, as demonstrated earlier, most agricultural policies may be expected to have some impact on the use and price of land, not only those explicitly directed at land. This fact is reflected in the structure of the model; regardless of the initial incidence of a policy, interrelationships between markets imply effects are felt through the entire value chain.

To illustrate these concepts, the PEM is used to run a scenario in which the level of support is reduced by 1% of the value of production in the year 2004 for the six regions represented in the model: Canada, European Union, Japan, Mexico, Switzerland, and the United States. The results are intended to be generic and illustrative. Therefore, even if the data represents support payments in each region as defined by the PSE in 2004, no attempt is made to fully represent the complexity specific policies (Box 2.1). Rather, the purpose of these experiments is to estimate the relative impacts on the land market of an equal change in support as defined broadly by four categories: market price support for crops, input payments, area payments for crops (production required), and historical entitlements.

An important consideration in designing experiments of this type is deciding how the policy is changed with respect to each commodity affected. Few modern agricultural policies are applied to a single commodity, especially in the case of the crops policies which are under investigation here, and so single-commodity only results can be misleading. For example, reducing area payments for all crops compared to reducing area payments for wheat only yields substantially different results. A complete policy simulation experiment is defined by the amount of change in support, and the distribution of that change across commodities.

Policy experiments are designed to be as neutral as possible between commodities. For MPS and area payments, where support rates may vary by commodity, the subsidy *rates* as applied to each commodity are reduced by the same proportion, preserving relative rates of support and so representing a uniform reduction of the policy. Support is reduced for crops, but not for beef or milk. Therefore, because of the change in relative returns, this leads to a shift in land use from crops to pasture.

Payments based on historical entitlements are assumed to have no impact on the relative *rental rates* of land for different land uses in agriculture. This assumption determines the distribution of the payments under the policy. For payments based on input use, the assumption that these generically apply to most purchased inputs with a single rate of support determines the distribution of payments under this policy. These inputs have a common supply that is not differentiated by the commodity in whose production they are used.

Box 2.1. Quantifying the impact of agricultural policies

The PEM analysis presented here is based on agricultural policies as measured by the PSE for a specific year, 2004. As such, it provides a snapshot in time of the situation in each of the OECD regions that are represented. Policies are grouped into four broad support categories: Market price support, Input support, Area Payments and Historical entitlements. This is done for practical reasons, trading-off detailed representation of individual policies for a broad overview that permits comparisons between different groups of policies in different OECD regions. Given the highly aggregate nature of the model and data, the PEM results should be interpreted as providing a rough order of magnitude, rather than a precise estimate. Nevertheless, an illustrative example highlighting the difference between for example Market price support and Historical entitlements can provide some general insights into the key differences between the impact of these policies on production, asset capitalization, etc.

The power of using illustrative examples is that it also permits policy analysis of policies that are currently at the stage of development and for which data is not yet available. A good example is the Single Payment Scheme in the European Union. Even if the policy has been in place since 2004 for some member countries, actual implementation only began in 2005 or 2006 in other member countries. Given that the Single Payment Scheme will be implemented differently depending on the member country, a precise quantitative assessment of its impact will require at a minimum:

- A model that represents individually each EU member country.
- To the extent that implementation differs by region within a country, the model may have to be even more disaggregated.
- Explicit acknowledgement of the possibility of market imperfections in a number of new member states.
- A sufficiently rich historical data set that permits econometric estimates of key model parameters (elasticities).
- Commodity coverage that includes all activities eligible for the Single Farm Payment.

Even this minimum list of requirements requires a significant level of resources -researchers, consultants, data gathering, model estimation and construction, etc. For example the EU Commission has launched a project (IDEMA) to study the impact of decoupling and modulation in the enlarged union. The project runs over a three-year time period, with participants from nine research institutions in different EU member countries. The maximum EU contribution is nearly EUR 1.4 million

Area payments and payments based on historical entitlements have their first incidence in the land market. Market price support has its first incidence in the market for the commodity output, and payments based on input use on the market for purchased inputs. As expected, the policies where the first incidence of payment is in the land market have a greater impact on the rental rate of land (Table 2.1). These policies change the rental rate directly and all other adjustments in the model are secondary to that initial shock. However, this does not imply that these forms of support have the greatest impact on land allocation (Table 2.2).

Table 2.1 Estimated impact of a reduction in support on land rental rates

Change, per cent

	Market Price Support		Input Support		Area Payments		Historical Entitlements	
	Cropland	Pasture	Cropland	Pasture	Cropland	Pasture	Cropland	Pasture
Canada	-3.10	0.04	-1.48	-1.24	-6.96	-1.00	-3.46	-3.46
EU15	-1.17	-0.32	-0.43	-0.71	-4.04	-0.74	-3.36	-3.35
Japan	-2.14	-0.11	-2.01	-0.93	-8.04	-0.81	-4.72	-4.69
Mexico	-3.55	-0.02	-2.20	-0.54	-6.15	-0.24	-1.82	-1.82
Switzerland	-3.29	-0.40	-0.90	-0.21	-14.70	-0.79	-3.70	-3.68
United States	-1.75	-0.10	-0.76	-1.40	-5.17	-0.86	-2.59	-2.59

Source: OECD PEM.

Table 2.2 Estimated impact of a reduction in support on land use

Change, per cent

	Market Price Support		Input Support		Area Payments		Historical Entitlements	
	Cropland	Pasture	Cropland	Pasture	Cropland	Pasture	Cropland	Pasture
Canada	-0.30	0.28	-0.10	-0.05	-0.65	0.49	0.00	0.00
EU15	-0.17	0.07	0.06	-0.02	-0.60	0.34	-0.02	-0.02
Japan	-0.10	0.08	-0.08	0.00	-0.32	0.33	-0.04	-0.04
Mexico	-0.35	0.13	-0.19	0.03	-0.61	0.22	-0.01	-0.01
Switzerland	-0.27	0.09	-0.07	0.02	-1.36	0.47	-0.01	-0.01
United States	-0.16	0.16	-0.01	-0.14	-0.47	0.41	-0.01	-0.01

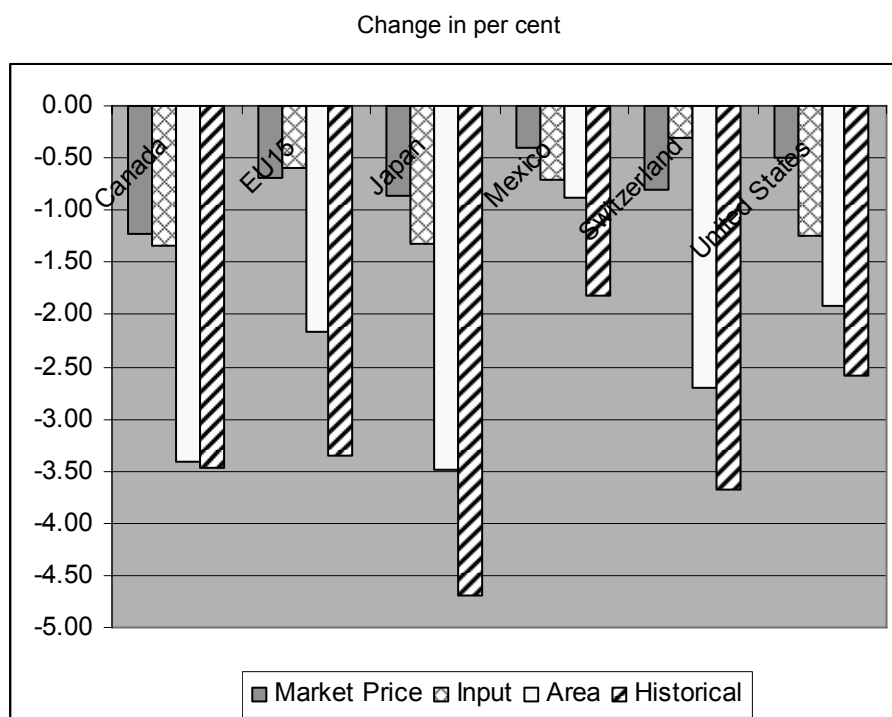
Source: OECD PEM.

The uniform proportional decrease in land rental rates brought about by reducing payments based on historical entitlements provides no incentive to re-allocate land across uses. Along the axis of relative rental rates for land, nothing has changed and so no adjustment occurs. Along the axis of relative costs of land vs. other factors of production, land has become more expensive as the demand price, defined as the rental rate plus subsidy, has increased. The incentive would be for producers substitute other factors of production for land, but there is no additional land available; the model assumes that total agricultural land area is fixed. Moreover, all commodities face the same incentive, which minimizes land movement between commodities as relative factor prices change.

In the case of area payments, reducing these payments moves land out of the commodities that currently receive these payments (major crops) into those that do not (pasture). This reflects the change in relative prices between land uses that result from the policy change. Reducing MPS reduces the rental rate of land because, like all factors of production, the demand for its use is derived from the value of production in the commodity market. Reducing the price of a commodity reduces the implied value of the factors that are used to produce it. Reducing input support makes land relatively more attractive as purchased factors become more expensive, but rental rates are still reduced as the implied reduction in production more than compensates for this relative price effect.

The results above consistently suggest a hierarchical ranking for the impact of the support categories on land rents. Historical entitlements have the highest impact on land rents. Recall that in terms of production distortion, historical entitlements have by simulation design no influence on production allocation decisions. At the other extreme, market price support has the lowest impact on land rents, yet is one of the most production distorting types of support (OECD, 2001). Figure 2.1 summarizes the results⁸.

Figure 2.1. Estimated impact of a reduction in support on land rents



Following the net present value (NPV) framework discussed in the next chapter, to estimate the expected impacts of the policy scenarios on land prices requires specifying a discount factor and a time horizon. To illustrate, a five percent discount factor is applied under different assumptions about how much longer the program would have continued in the absence of the reform carried out as part of the policy experiment. In this approach, the longer the policy is expected to be in place, the greater the effect on land prices (Table 2.3).

Table 2.3 Relating change in rental rate to change in land value

Crop Land	Change in rental rate	Change in Land price, by time horizon		
		3-year	10-year	20-year
Canada				
Market Price Support	-2.6	-7.1	-20.2	-32.6
Input Support	-1.2	-3.4	-9.6	-15.6
Area Payments	-5.9	-16.0	-45.4	-73.2
Historical Entitlements	-2.9	-8.0	-22.6	-36.4
Pasture Land				
Market Price Support	0.0	0.0	0.1	0.1
Input Support	-0.3	-0.8	-2.2	-3.6
Area Payments	-0.2	-0.6	-1.8	-2.9
Historical Entitlements	-0.8	-2.2	-6.2	-10.0
European Union				
Crop Land				
Market Price Support	-6.8	-18.5	-52.4	-84.5
Input Support	-2.5	-6.8	-19.4	-31.3
Area Payments	-23.7	-64.4	-182.7	-294.9
Historical Entitlements	-19.7	-53.6	-151.9	-245.2
Pasture Land				
Market Price Support	-0.4	-1.0	-2.9	-4.6
Input Support	-0.8	-2.2	-6.2	-10.0
Area Payments	-0.8	-2.3	-6.6	-10.6
Historical Entitlements	-3.8	-10.4	-29.5	-47.6
Japan				
Crop Land				
Market Price Support	-18.5	-50.3	-142.6	-230.1
Input Support	-17.5	-47.6	-135.0	-217.9
Area Payments	-158.1	-430.6	-1220.8	-1970.3
Historical Entitlements	-61.7	-168.0	-476.4	-768.8
Pasture Land				
Market Price Support	-1.6	-4.3	-12.3	-19.8
Input Support	-13.1	-35.7	-101.1	-163.2
Area Payments	-11.4	-31.2	-88.3	-142.6
Historical Entitlements	-65.9	-179.5	-509.1	-821.6

Table 2.3 Relating change in rental rate to change in land value (*cont.*)

Crop Land	Change in rental rate	Change in Land price, by time horizon		
		3-year	10-year	20-year
Mexico				
Crop Land				
Market Price Support	-5.3	-14.4	-40.9	-65.9
Input Support	-3.3	-8.9	-25.4	-40.9
Area Payments	-9.2	-25.0	-70.8	-114.3
Historical Entitlements	-2.7	-7.4	-21.0	-33.8
Pasture Land				
Market Price Support	0.0	0.0	0.0	0.0
Input Support	-0.1	-0.3	-0.9	-1.5
Area Payments	-0.1	-0.1	-0.4	-0.7
Historical Entitlements	-0.4	-1.1	-3.1	-5.0
Switzerland				
Crop Land				
Market Price Support	-47.5	-129.2	-366.4	-591.3
Input Support	-13.0	-35.5	-100.8	-162.6
Area Payments	-212.3	-578.1	-1639.2	-2645.5
Historical Entitlements	-53.4	-145.4	-412.4	-665.5
Pasture Land				
Market Price Support	-2.1	-5.6	-15.8	-25.6
Input Support	-1.1	-2.9	-8.3	-13.4
Area Payments	-4.1	-11.1	-31.5	-50.9
Historical Entitlements	-19.0	-51.7	-146.6	-236.6
United States				
Crop Land				
Market Price Support	-4.3	-11.7	-33.2	-53.6
Input Support	-1.9	-5.1	-14.4	-23.2
Area Payments	-12.7	-34.6	-98.2	-158.5
Historical Entitlements	-6.4	-17.3	-49.2	-79.4
Pasture Land				
Market Price Support	0.0	-0.1	-0.3	-0.5
Input Support	-0.5	-1.4	-3.9	-6.2
Area Payments	-0.3	-0.8	-2.4	-3.8
Historical Entitlements	-0.9	-2.5	-7.1	-11.5

For example, reducing area payments is estimated to reduce crop land rents by USD 12.7 per hectare in the United States. If the expectation was that these payments would have continued for three more years, the effect of the reform would be to reduce land prices by about USD 35 per hectare, but if the program had been expected to remain unchanged for 20 years, the effect on land price would be more than USD 158 per hectare. The impact on land rents and prices in countries where land is scarcer relative to value of agricultural production (*e.g.* Switzerland and Japan) is even more pronounced.

These results highlight the difficulty of predicting the effects of policies on land prices. The NPV equation, which itself must be recognized to be of limited accuracy, can yield wide ranges of price changes depending on the assumption of time frame and discount rate. Moreover, the results can differ substantially between countries. By extension, although not explored in this analysis, differences within a country (*e.g.* land in remote rural areas compared to land next to urban centres) can also be very large. Changes in land price of these magnitudes can lead to significant welfare impacts when policies are reformed, and dealing with the limited information available to estimate those impacts is a challenge for policy makers pursuing reform.

Summary

This chapter discusses the potential for agricultural policies to become capitalised in the value of land. From the perspective of economic theory, the degree to which this capitalisation occurs is a function of how the policy is implemented, specifically its initial incidence, the elasticity of supply of land, and the elasticity of substitution between land and other factors of production in agriculture. The analysis also underlines that it is difficult, *ceteris paribus*, to precisely predict the impact of policies on the price of land.

The analysis shows that the capitalisation of support into land values tends to be inversely related to the degree of market distortion. A more decoupled program is less likely to affect production decisions, but its benefits are more likely to be capitalised in land to some degree.

When policies become capitalised in land values the cost of production is increased. The extent to which higher rental rates for land translate into higher purchase prices for land can be estimated using the net present value framework, which equates land prices as the sum of a future stream of revenues (rental rates) that they provide. However, this approach requires knowledge of the subjective discount rates of individuals, their expectations regarding future events, and their time horizon for decision making. In addition, numerous other factors lead to unpredictable market dynamics that have left previous efforts to relate land rental rates to prices unsatisfactory. Some of these issues are the subject of the next chapter.

NOTES

1. This in turn depends on the feasibility of alternative uses for the land. For example, if the land is only suitable for agriculture then all of it will already be in agriculture and changes in price will not result in any more land moving to agricultural use. However, if the land is suitable and in fact used for a broad variety of applications, increasing agricultural land rent will move land from other uses which have become relatively less profitable as a result.
2. These regulations usually apply to all agricultural land and therefore affect the mobility of land between agricultural and non-agricultural uses. Often they are not designed as to protect specific agricultural land uses (*e.g.* crop) from competing agricultural land uses (*e.g.* livestock). However, in many countries there are legal provisions to prevent conversion of some agricultural land areas (*e.g.* environmentally sensitive areas) to certain agricultural uses (*e.g.* intensive livestock production).
3. Usually, the same range is adopted for the mobility of factors/inputs within the agricultural sector, but with all elasticity values moving up to higher levels indicating that land, family labour and, to a lesser extent, other factors/inputs are more mobile between alternative agricultural uses than between agriculture and other non-agriculture uses.
4. Another important difference with respect to the basic models used in the graphical analysis is that global simulation models often consider several countries, some of them assumed to be large countries. Hence, an exogenous (policy) shock in one of these large countries will induce adjustments on world markets and in turn of output prices on national markets.
5. For more information on the PEM, see *Market Effects of Crop Support Measures* (OECD, 2001).
6. PEM is a partial equilibrium model, and therefore does not capture effects on land that come from outside the agricultural sector. Total land in agriculture is assumed to be fixed.
7. In previous documents using the PEM, the term “price” for land is used. The more precise term “rental rate” is preferred here in order to maintain the distinction between stock (price of land) and flow values (rental rate) that is important in the context of this document.
8. The results for crop and pasture land have been combined into a single land category using their respective initial areas as weights.

Chapter 3.

Land prices, Empirical Evidence and Literature Review

Understanding the relationship between returns, farmland rentals and farmland values

The general theoretical framework for the capitalisation of agricultural support into the production factor land has been developed in Chapter 2. This chapter reviews the extensive empirical literature on this topic; it summarizes what we know about the size of the impact of agricultural policies on land rentals and land prices. The empirical literature confirms that we know relatively well the impact of policies on land rentals, but we know less about the working of land markets and the formation of land transaction prices. The consensus emerging from the empirical literature is that government policies can indeed affect rentals through the capitalisation phenomenon. In addition, the land rent has a positive relation with the transaction price of land, but it is only one of its many possible explanatory factors.

The review is presented in two parts. The first part outlines the method to connect land rentals and transaction prices that is used in the overwhelming majority of studies. The Net Present Value (NPV) method, extended and amended in various directions, is the workhorse of empirical work in the field. The second section surveys the empirical evidence of how agricultural policies affect land prices or how they affect rental rates, relying mainly on studies published since the 1990's. The results are summarised tabular form.

While there has been continued criticism of the NPV framework, based on theoretical as well as econometric arguments, it continues to be used in many empirical studies. This empirical literature confirms the insights from chapter two: agricultural policies can have a significant impact on returns to land. However, agricultural policies through their impact on (expected) farming returns are just one of the factors that explain the *level* of land prices. Interactions with the capital market, the pressure from urbanization, non-agricultural policies in particular land zoning restrictions, all enter into a fuller understanding of land price formation. However, the empirical literature enables us to distil information on the influence of changes in agricultural payments on changes in land values, holding all other factors constant. This information is summarized in Table 3.2¹ as the elasticity of land value with respect to support, that is, the percent change in land values due to a 1% change in support.

The present value framework and its extensions

Understanding the main determinants of agricultural land price formation is a topic of intensive study in the literature. Following the basic Ricardian insight, land prices are thought to be determined by the current and expected future stream of benefits derived

from its use. These benefits can be distinguished into two broad categories. The first are the stream of benefits from productive use, and include returns from the market place for production of agricultural output, next to the stream of benefits that are directly or indirectly a result of government support policies. The second relates to anticipation of future capital gains – for example, if prices increase because of urban pressure.

The value of the cash rents derived from land reflects the current (single period) net value derived from its productive use. This *rental rate* represents a flow concept: it is the return that the asset delivers by using it during a given period of time. The *price of land*, in contrast, relates to the value of the asset itself. The flow concept (rent) can be translated into the value of the stock (asset price), by a basic capitalisation formula.

The basic capitalisation formula

The NPV approach postulates that the price of an income-earning asset is equal to the discounted expected value of the stream of future net returns or rents to this asset. Assuming an infinite time horizon, the equilibrium asset price at the beginning of time period t (L_t) may be written as:

$$L_t = \sum_{i=0}^{\infty} \frac{E(R_{t+i})}{(1+r_{t+1})(1+r_{t+2})...(1+r_{t+i})} \quad [1]$$

where R_t is the net real return at the end of time period t , generated from owning the asset, r_t is the time varying real discount rate for year t and E is the expectation on return conditional on information in period t .

If it is assumed that the discount rate is constant, agents are risk neutral and differential tax treatments of capital gains and rental income are ignored, then equation [1] becomes:

$$L_t = (1+r)^{-1} \sum_{i=0}^{\infty} \frac{E(R_{t+i})}{(1+r)^i} \quad [2]$$

Assuming the net return is constant in each period (R^*), equation [2] further simplifies to the basic capitalisation formula:

$$L_t = \frac{R^*}{r} \quad [3]$$

This basic capitalisation formula, based on strong assumptions, underlies most studies of farmland price formation, with L_t as the price of land and R^* as the real net return to farmland. Net returns include both revenue from the market, as well as revenue from government support. Net returns are not directly observable, but can be approximated by net farm income or cash rents.

Refining the basic capitalisation formula

It is clear from the literature that while farm income or rent can help explain a significant portion of farmland price movements, it cannot be considered as the only determinant of farmland price fluctuations. This suggests that simple capitalisation formulas fail to provide an accurate representation of farmland prices.

The net present value framework can be refined in a number of different ways, and indeed much of the literature has attempted to incorporate alternative assumptions into the basic setup. Such extensions will either lead to a modified stream of periodic revenues, R in the formulae above, or to different discount rates, r . Interactions between the land market and the capital markets is one broad group of extensions that have been tried. Another set of extensions relates to expectations. If agents form expectations about the future returns and opportunity cost of land, then this will affect the rate at which they discount future revenues streams. Finally, the NPV framework can be extended to include the effect of alternative, non-agricultural, uses of land. Having the option to convert land to urban uses, for example, affects the opportunity cost of farm land, and this can be captured by appropriate modifications of the discount rate.

In their quest for an explanation of land prices, researchers have progressively introduced non-agriculture related variables, and over time the importance of these factors has been corroborated empirically. However, returns to farming, including receipts from government payments, continue to play a structural role in the theories and empirical estimations the attempt to shed light on the evolution of land prices. The following paragraphs sketch the various extensions to the basic NPV framework that have been introduced over the last 25 years.

Capital markets

Capital gains feature prominently in the empirical land pricing literature of the 1980s. This major modification of the basic capitalisation formula was proposed by Melichar (1979) who hypothesized that growth rate in returns had been the driving force behind increasing land values throughout the 1970s in the US. Capital gains are incorporated into the traditional capitalisation formula by considering that the price of land at the beginning of each year t is equal to the discounted expected real return over t plus the discounted expected real price of land at the beginning of year $t+1$. Traill (1979) used expected farm income to proxy capital gains and estimated a farmland price equation on the basis of UK time series data. The introduction of growth in earnings from land was also followed by Baker *et al.* (1991), who additionally allowed for capital gains taxation. Alston (1986) and Burt (1986), in their work on the US, incorporated the differential tax treatment of income and capital gains and also decomposed the discount rate into a risk premium for land and the nominal interest rate.

The role of inflation with respect to capital gains was introduced by Feldstein (1980) who accounted for the portfolio impact of changes in non-farmland investment opportunities and the role of inflation. The idea is that increased expected inflation causes a decrease in the discount rate due to the preferential treatment given to capital gains income, and therefore real land prices should increase with expected inflation.

Credit market constraints and market imperfection were incorporated by Shalit and Schmitz (1982) to explain part of US farmland price fluctuations. Assuming that rising land prices provide extra equity for loan collateral, they derived a capitalisation formula where the accumulated debts per acre appeared as a positive determinant of land prices.

Time varying or different discount rates

Several authors have specified their discount rates as varying over time or as different between distinct sources of income, in particular market returns and government returns.

The rate at which future income streams are discounted may vary over time, as in equation [1] above. This may be the case if time preferences or interest rates change during the course of time. Vantreese *et al.* (1989) based their study theoretically on the NPV with a time-varying discount rate. Cavailhès and Degoud (1995) also estimated a linear relationship between land prices and returns to land and interest rate.

Different discount rates maybe used for different streams of returns to farmland. Receipts from government payments might be considered more stable than market returns, and could be discounted at a lower rate. Weersink *et al.* (1999) allowed the discount rate to differ between these two sources, which enabled them to test whether government payments were seen as more transitory or permanent than market returns. Similarly Duvivier *et al.* (2005) discounted the distinct sources of income by different rates that were varying over time, and also showed that market returns and direct payments were co-integrated with land prices.

Treatment of expectations

Market parties have expectations about the future development of revenues streams and this will affect their valuation of the opportunity cost of land. Just and Miranowski (1993) tried several specifications for expectation in their NPV formulation: rational, adaptive, extrapolative and naive. The best fit was obtained with naive expectations: assume that tomorrow is like today.

Most authors specify adaptive expectations: expectations are continuously adjusted to correct for past forecasting errors. Burt (1986), Featherstone and Baker (1988), Veeman *et al.* (1993) and Cavailhès and Degoud (1995) all specify adaptive expectations in the NPV equation on the basis of some distributed lag structure on revenues. These studies tend to systematically find that long-run impacts of changes in farm earnings are relatively larger than short-run impacts, suggesting that farm earning are a structural determinant of land prices.

Accounting for alternative land uses

The opportunity cost of farm land, and hence its market price, depends on possible alternative uses. If the option exists to convert farm land to urban there will be a positive value associated to that option, leading to land prices that exceed their discounted farm revenue stream. The impact of urban pressure on farmland prices has been investigated in several studies relying on the present value framework where potential returns from non-agricultural uses of land are introduced (e.g. Arnott and Lewis, 1979; Robison *et al.*, 1985; Plantiga and Miller, 2001; Plantiga *et al.*, 2003).

Just and Miranowski (1993) and Goodwin *et al.* (2003) extended the NPV to account for possible land conversion. Goodwin *et al.* (2005) factor land conversion into in their model of expectations. Barnard *et al.* (1997) and Duvivier *et al.* (2005) are other examples that included proxies for alternative uses of land in their regression.

Outside the NPV framework, the regional and urban economics literature favours econometric estimation of price equations, with a region's population density, the accessibility to a city or a motorway, etc., considered as potential factors (e.g. Maddison, 2000; Tsoodles *et al.*, 2006). More structural approaches use a fully-fledged urban economic model of residential location (e.g. Cavailhès and Wavresky, 2003).

The present value approach questioned by econometrics

The NPV approach has been subject to criticism. The basic NPV formula suggests that land prices and rental rates (or returns) should move together in time. In practice, however, land prices will tend to show a larger amount of volatility than the movement of rents, suggesting a non-stationary relationship. A number of studies using co-integration² techniques reached similar conclusions. Campbell and Shiller (1987) showed that if the NPV approach is correct, then it has to satisfy two restrictions: (i) land rents and land prices should have the same time series properties and (ii) the spread, defined as the stationary linear relationship between land rents and prices should add useful information in forecasting future changes in rents given past changes in rents. These restrictions have been used as a test for the appropriateness of NPV in land valuation in a number of subsequent studies.

Falk (1991), Clark, Fulton and Scott (1993) showed that the NPV approach did not work well for US farmland prices. Hallam *et al.* (1992) reached the same conclusion for UK data. Further econometric tests are equally dismissive of the NPV approach as explanation for farmland prices. Studies incorporating more sophisticated assumptions such as speculative bubbles (Featherstone and Baker (1987), Falk (1992), Falk and Lee (1998)) and time-varying risk premia (Hanson and Myers (1995)), Tegene and Kuchler (1993)) also failed to produce conclusive results.

Beyond NPV: Other methods used

Lence and Mishra (2003) and Roberts *et al.* (2003) depart from the NPV approach and instead use a behavioural model based on profit maximisation, to investigate the effect of agricultural policy on land rents. Whitaker (2006) points out that land rents may be empirically superior for investigating the effects of domestic support on land values for two reasons. First, rental rates are observed in the market while land values are often stated by the owner and therefore subjective. Second, rental rates are less affected by urban pressures and other non-agricultural factors when contracts are for short periods of time (for example, usually one year in the U.S.), and may therefore reflect the value of agricultural activity on the land. When contracts are for longer periods, the impact of support on land values may be less important than other factors not related to agriculture.

A few studies based their investigation on the hedonic pricing approach. This approach is common in consumer research and environmental valuation, and was firstly applied to land by Palmquist (1989). The hedonic pricing approach can best be illustrated by an example: if urban housing prices vary with the presence of parks in the neighbourhood, then the valuation for parks can be derived by observing housing prices. Of course, proper adjustments have to be made for other factors, such as distance, the proximity of public transportation etc, but the 'hedonic price' of parks can be retrieved for observed prices of housing. ERS USDA (2001b) and Taylor and Brester (2005) followed this approach and included as determinants soil quality, urban influence, irrigation, and parcel size.

A few other approaches can be mentioned. Offut and Shoemaker (1990) used a translog cost function to evaluate the share of land in production costs. Rutherford *et al.* (1990) used a general equilibrium model focused on the capitalisation of wheat subsidies, while Traill (1982) used a partial equilibrium model, where the price of land was assumed to depend on net farm income, expected growth in land prices and in net farm income, interest rate and amount of land sold. Bierlen *et al.* (2000) undertook a survey to investigate the effect of a change in payments on land tenure arrangements.

Government support, land prices and rents: empirical evidence

This section summarizes the empirical evidence on the impact of government support on land prices. The overwhelming majority of the empirical work is based on the NPV framework, usually with one or several of the modifications discussed above. Some studies look directly into land prices (the price of the stock), others into land rentals (the return on the flow of services). The impact of policies on the value of these indicators can be summarized in terms of elasticity: this reflects the percent change of land prices (or rentals) brought about by a one percent change of payments. For example a value for the land rental elasticity of 0.5 means that a 10% increase in payments leads to a 5% increase in land rentals ($10\% \times 0.5$). Using the capitalisation formula the percent change of land rentals can be converted into changes in land prices.

Explaining price formation in land markets is no trivial task. As we have seen above many attempts have been made to extend the theory to allow a more precise estimation of the effects of land-related policies on land prices. Given the fundamentally immobile characteristics of land, the ‘law of one price’ is unlikely to hold within in any given economy. Possibilities for arbitraging are limited by various kinds of immobility and land prices tend to be specific to specific uses (*e.g.* wheat land) or specific to a certain geographic region (*e.g.* peri-urban land markets). Given the spread and variability in price formation it is therefore impossible to derive meaningful simple averages. The greater the degree of immobility, the more crop-specific and spatially localized the land price formation will tend to be. Chapter 4 discusses the impact of policies, both agricultural and non-agricultural on land mobility.

When interpreting the vast amount of empirical work it is therefore important to take its context-specificity into account. With all these caveats in mind, the body of empirical work allows some observations on the relationships between various types of agricultural policies and returns derived from land, leading ultimately to a relationship between agricultural support and land prices.

Summary

A total of 25 empirical studies is summarized in Table 3.1. The US land markets are the most intensively studied, covering almost four fifths of the studies in the survey. Canada and some individual EU member states account for the rest of the surveyed empirical work. The main conclusions emerging from the body of empirical work can be summarized as follows:

- Land prices and farm returns (including subsidies) are positively related, but the NPV-predicted price tends to be lower than actual transaction prices, suggesting that other factors than farm returns play a role.

- Government payments and other type of support (price support, quotas) are potentially an important factor in explaining land prices. However the empirical evidence is mixed. Many studies find empirical evidence that government support accounts for a variable proportion of land prices, up to 40% depending on the region and time period in question. Most studies find that government support only accounts for 15-20% of land prices.
- Land prices and rents respond positively and significantly to government support. Although the magnitude of the response varies across studies³, it has consistently been shown to be less than 1. Such inelastic response may reflect the perception of uncertainty with respect to future government support. It might also be due to requirements that often accompany farm programs, such as set-aside and cross-compliance.
- In general, studies have concluded that land prices are more responsive to government support than to market returns. Government payments may be discounted more heavily, that is to say are seen as more transitory, than market returns.

Although some contradictions remain among findings from the empirical studies, what appears clearly is that a significant share of government support is indeed capitalised into land prices. It is also clear that the way farmers perceive the policy, whether it is likely to be temporary or permanent, has crucial implications for the capitalisation of support into land prices. However, this does not mean that government support is the most important factor, as other factors, some of which are not related to agriculture may also be important. This point will be further elaborated in Chapter 4.

NOTES

1. Studies of land markets in the United States account for almost four fifths of the studies in this survey. Few studies on land markets in Europe are available. A possible explanation for this difference may be the relatively higher population density in Europe; non-agriculture factors (such as urban pressure) play a more important role and may make it more difficult to obtain data and therefore empirical estimates of the impact of agricultural policies on land.
2. A stable equilibrium relationship can be estimated if variables have the appropriate statistical properties. Such variables are said to be “co-integrated”.
3. Oltmer and Florax (2001) attempted to compare statistically the findings from 17 different studies reporting elasticities of land prices with respect to earnings including farm support. Using meta-analysis based on several factors regarding the methodology, the commodity, the location, the period and the type of data, they found no significant differences between elasticities of land prices with respect to land returns according to the methodology used. They also reported that the elasticities with respect to returns in which both price and income support were included, were higher than with respect to returns including only one type of support.

Tabular Summary of the Literature Review
Table 3.1. Characteristics of the studies

Study	Objective	Data		Method	
		Region	Date	Type of data	Econometrics used
Trall (1982)	Effect of an increase in agricultural prices on land prices	UK	1950-1978	Annual data	PE Iterative GLS
Featherstone and Baker (1988)	Effect of a move towards more free market on land prices and cash rents	Tippecanoe County in Indiana	1965-1985	County's averages on 1 February 26 obs	NPV with adaptive expectations OLS
Vantresse <i>et al.</i> (1989)	Effect of burley tobacco quotas on land values	Kentucky	1973-1985	Sales > 10 acres Bare land 2,327 obs	NPV with varying discount rate OLS
Offutt and Shoemaker (1990)	Effect of acreage control programs on share of land in production costs	United States	1948-1984	Aggregate data	Translog cost function
Rutherford <i>et al.</i> (1990)	Effect of conditionality in wheat programs on land prices	United States	Calibration with 1981		GE model
Goodwin and Ortalo-Magné (1992)	Effect of wheat subsidies on land values	United States Kansas and North Dakota, Canada Manitoba and Saskatchewan, French Centre and Picardie regions	1979-1989	Annual averages	NPV GMM on pooled data
Clark <i>et al.</i> (1993)	Whether direct and indirect payments are capitalised in land prices	Canada Saskatchewan	1950-1987	Annual averages	NPV Co-integration tests
Just and Miranowski (1993)	Share of government payments in explaining land prices and fluctuations in land prices	United States	1963-1986		Utility maximisation Debt and taxation Naive expectations Non-linear SUR
Veeman <i>et al.</i> (1993)	Effect of direct payments on land prices	Canada, Alberta, Saskatchewan, Manitoba, Ontario	1961-1987	Land and buildings	PV with adaptive expectations ML

Study	Objective	Data			Method	
		Region	Date	Type of data	Base model	Econometrics used
Cavallières and Degoud (1995)	Effect of the 1992 CAP reform on land prices	France	1961-1993	Sale prices Annual averages	Basic NPV and NPV with adaptive expectations and varying discount rate	OLS and instrumental techniques
Barnard <i>et al.</i> (1997)	Effect of direct payments on cropland prices	20 United States Land Resource Regions	1994-1996	Farmers' estimates of cropland	None	OLS and non-parametric regression
Weersink <i>et al.</i> (1999)	Effect of direct payments on land prices	Ontario	1947-1993	Annual averages	PV with varying and different discount rate	Non-linear SUR
Bierlein <i>et al.</i> (2000)	Effect of 1996FAIR Act on lease arrangements	Arkansas	November 1997	214 observations	Survey	None
Lamb and Henderson (2000)	Effect of 1996 FAIR Act on land prices in Corn Belt	US states in the Corn Belt	1965-2002		NPV with varying discount rate	None
ERS USDA (2001a)	Effect of direct payments on land prices	US	1972-2001	Land and buildings	NPV	None
ERS USDA (2001b)	Effect of crop direct payments on land prices	United States	2000	Bare land of farms receiving payments County's averages	Hedonic	Not specified
Lence and Mishra (2003)	Effect of various government payments on land cash rents	Iowa	1996-2000	County's annual averages	Profit maximisation	GMM; account for spatial autocorrelation
Roberts <i>et al.</i> (2003)	Effect of PFC payments on land rents	United States	1992 and 1997	> 61 000 observations	Profit maximisation	OLS
Flanders <i>et al.</i> 2004	Effect of land returns on cropland vs. pasture	Georgia	1967-2002		NPV	ML
Goodwin <i>et al.</i> (2003)	Effect of various government payments on land prices and rentals	United States	1998-2001	Crop farmers' estimates Pooled data 13 606 obs	NPV with non-agricultural uses	Probability-weighted bootstrapping
Goodwin <i>et al.</i> (2005)	Effect of various government payments on land prices and rentals	United States	1998-2001	Crop farmers' estimates Pooled data 5 929 observations	NPV with non-agricultural uses; expectations accounted with averaged past values	Probability-weighted bootstrapping

Study	Objective	Data		Method	
		Region	Date	Type of data	Econometrics used
Duvivier <i>et al.</i> (2005)	Effect of 1992 CAP reform on arable land prices	Belgium	1980-2001	Sale price District's average	NPV with different discount rates; expectations accounted with averaged past values
Shaik <i>et al.</i> (2005)	Effect of 12 Farm Bills on land values	United States	1940-2002	Not specified	NPV accounting for counter-cyclicality of payments Hedonic
Taylor and Brester (2005)	Effect of US sugar policy on land values	Montana	1986-1999	Sale price Irrigated land 569 observation	Triangular-structure simultaneous equations GLS
Shaik <i>et al.</i> (2006)	Effect of 13 Farm Bills on land values	United States, Southern and other states	1940-2004	Not specified	NPV accounting for counter-cyclicality of payments Triangular-structure simultaneous equations

"Land prices/values" stands for "agricultural land prices/values". "Obs" stands for "observations". "Different" discount rate stands for "different across income sources", while "varying" discount rate stand for "varying over time".

Table 3.2. Empirical evidence of agricultural support

Study	Main country	Date	Type of support investigated	Elasticity of land value with respect to the support	Share of land value accounted for support or effect of decrease of support	Other findings
Trall (1982)	United Kingdom	1950-1978	Increase of agricultural prices by 1%	10		
Featherstone and Baker (1988)	United States	1960-1985	More towards more free market		Move would increase less land prices and decrease more cash rents than under policy continuation	
Vantreese <i>et al.</i> (1989)	United States	1973-1985	Burley tobacco quota in pounds per acre		12-39% <15% after 1980	
Offut and Shoemaker (1990)	United States	1948-1984	Acreage control programs			Increased by 1% the value share of land in production costs
Rutherford <i>et al.</i> (1990)	United States	Calibration with 1981	Wheat price support			Dilution of 75% of the capitalisation
Goodwin and Ortalo-Magné (1992)	United States Canada, France	1979-1989	Wheat PSE	0.38		Decrease of 50% PSE would increase by USD 60-120 (resp. decrease by USD 50) prices in France (resp. US and Canada)
Clark <i>et al.</i> (1993)	Canada	1950-1987	Direct and indirect subsidies for grain			Evidence of capitalisation
Just Miranowski (1993)	United States	1963-1986	Government payments		15-25%	Government payments do not account for fluctuations in land prices
Veeman <i>et al.</i> (1993)	Canada	1961-1987	Direct payments	SR: 0.26-0.47 LR: 0.55-1.79	Removal would decrease prices by 4-6% in SR and 12-30% in LR	
Cavailhès and Degoud (1995)	France	1961-1993	Dummy for 1992 CAP reform			In three regions the prices are lower after reform due to pessimistic expectations
Barnard <i>et al.</i> (1997)	United States		Direct government payments	0.12-0.69		

Table 3.2. Empirical evidence of agricultural support (cont.)

Study	Main country	Date	Type of support investigated	Elasticity of land value with respect to the support	Share of land value accounted for support or effect of decrease of support	Other findings
Weersink <i>et al.</i> (1999)	Canada	1947-1993	Direct government payments	SR: 0.009 LR: 0.625		Government payments discounted less heavily than market returns
Bierlen <i>et al.</i> (2000)	United States	1997	1996 FAIR Act			No strong changes in lease arrangements
Lamb and Henderson (2000)	United States	1996-2002	Time period that includes 1996 FAIR Act			Prices increased by 31% in 1996-1998 but decreased by 16% in 1998-2002
ERS USDA (2001a)	United States	1972-2001	Government payments		4% in 1972-1981 19% in 1982-1989 13% in 1990-1997 25% in 1998-2001	
ERS USDA (2001b)	United States	2000	Crop direct payments		20%	38% (resp. 62%) of payments were received by operator (resp. non-operator) owners
Lence and Mishra (2003)	United States	1996-2000	Total government payments According to type of payments	Effect of USD 1 payment on rent: +USD 0.13 Figures are USD+0.85 for PFC and market loss payments, USD -0.23 for LDP		
Roberts <i>et al.</i> (2003)	United States	1992 and 1997	PFC payments without conservation payments	Effect of USD 1 payment on rent: +USD 0.23-0.76 in 1992, +USD 0.33-USD 1.55 in 1997		
Goodwin <i>et al.</i> (2003)	United States	1998-2001	Total government payments According to type of payments			Findings questionable due to the non-account of expectations

Table 3.2. Empirical evidence of agricultural support (cont.)

Study	Main country	Date	Type of support investigated	Elasticity of land value with respect to the support	Share of land value accounted for support or effect of decrease of support	Other findings
Goodwin <i>et al.</i> (2005)	United States	1998-2001	Total government payments According to type of payments	Effect of USD 1 payment on price: USD +13 Effect of USD 1 LDP on price / cash rental / share rental: USD +27 / USD +0.83 / not significant		Cash-lease landlords successful in getting part of payments although such sharing is not established by legislation
Duvivier <i>et al.</i> (2005)	Belgium	1980-2001	Direct payments to crop and set-aside	0.17-0.34		
Shaik <i>et al.</i> (2005)	United States	1940-2002	Government payments	0.35	30%	
Tayl)	or and Brester (2005)United States	1986-1999	Domestic price of sugar beet (kept high due to import restrictions)	0.16	38% in 1965, 19% in 2002	
Shaik <i>et al.</i> (2006)	United States	1940-2004	Government payments	0.12 in 2002-2004	Lower (higher) before (after) 1990 in Southern States than in other states	

SR = short run

LR = long run.

Chapter 4.

A Framework to Analyse Policies that Affect Asset Capitalisation and Mobility

Asset capitalisation and asset mobility are two dimensions that are important for policy reform. The discussion thus far has concentrated on government policies directly provided as price support or subsidies to agriculture. This chapter broadens the discussion to include other policies and puts them in a general guiding framework. The framework encompasses agricultural policies as well as other policies such as taxation, rules and regulations. This is followed by a qualitative assessment of how other policies might impact asset mobility in agriculture, using information gleaned from various government information sources¹ and five commissioned country case studies for France, Japan, Korea, Mexico and Norway.²

Government support can be provided to agriculture through programs that deliver price support and subsidies through payments based on output or input use. The level of this support can be measured as, for example in the OECD PSE, either budgetary payments or as market price support (MPS). Government support to agriculture may also be provided through means that favour agricultural activities, such as rules and regulations. Farmers and landowners in OECD countries frequently benefit from special tax treatment, principally in the form of concessions. In addition, a myriad set of rules and regulations often applies to the use of agricultural land and other assets or to land price formation. Most of these policies are not measured by standard indicators such as the PSE. Moreover, given the nature of the policies it is generally difficult to construct well-defined measures that reflect the support equivalent or “quantity” of these policies.

Taken together all policies, whether applied directly as support to agricultural production or indirectly through rules and regulations, have potentially important implications for production, asset mobility and asset values. An integrated analysis of all policies is important for assessing the capacity of farmers (and the agricultural sector) to adapt to changes in market conditions and in government policy, particularly policy reform that aims to reduce overall levels of support.

Asset capitalisation and mobility in agriculture: what is the role of policy?

In theory, market forces allocate assets to their most productive use and to the most efficient farmers. Governments intervene in markets to meet policy goals -to provide public goods, to correct externalities, to preserve the environment or rural economies, etc. Some of these policies influence asset allocation in favour of a particular activity, factor of production, or group of individuals. This has implications for the productivity and competitiveness of the farming sector as a whole. Policies affect not only current income,

but through capitalisation they also modify the value of farm assets, and hence have an impact on wealth.

The capitalization of government support into asset values can reduce asset mobility, mainly because entrants into the sector and existing farmers wishing to expand are faced with higher asset prices. In addition a number of other policies, mainly in the form of tax rules and other regulations, can also reduce asset mobility. This can further enhance the capitalization phenomenon because, as seen in the theoretical discussion, the least mobile assets are the ones most likely to be associated with the benefits of government support.

Focusing on land, it was seen in Chapter 2 that the supply of land is a reflection of the number of alternative uses to which land can be put. The supply of land also depends on the application of other policies and regulations such as zoning restrictions that limit land conversion between different uses. Lastly, policies that regulate who can own land and under what conditions land may be purchased, sold or leased also have an impact on land supply. The impact of policies on land use may be grouped into three broad categories.

The first category concerns the allocation of land between different uses in agriculture. This includes mobility between different agricultural activities such as crops, livestock (pasture), fruits and vegetables, etc. Land is allocated according to the relative benefits and costs in alternative activities, as it may be particularly suitable for production of a commodity by virtue of its location, climate, slope, or soil type. Land may also be allocated depending on the government policies that are in place to support agricultural production. For example programs that favour the production of crops have implications for other land uses such as pasture for livestock. In practise, mobility between different uses within agriculture is influenced by a mix of the physical characteristics of the asset itself, farming practices and the existing government policy set.

The second category is asset mobility between different owners. This aspect relates to the entry and exit of farmers, and to the exchange of assets via sales or rentals. Policies that intervene on sales markets (*e.g.* regulations governing purchase and sale), on asset transmission (*e.g.* inheritance rules), and on incentives to enter or leave the agriculture sector (*e.g.* early retirement measures) all play a role in determining the extent to which assets are mobile between different asset owners.

The third category is asset mobility between agriculture and non-agriculture uses. This may include the conversion of farmland to land for residential, industrial, nature, forest or recreational uses. All these activities are in competition for land. In many OECD countries, asset mobility is influenced by legal restrictions on the conversion of assets to non-agriculture uses, usually through zoning regulations.

Demographic pressure, particularly near large urban centres, has considerably increased demand for land in housing and industrial activities with consequences for the price of land. Many studies³ show that under these conditions the influence of non-agricultural demands can be more important than the influence of government policies in support of agriculture. However, the impact on agricultural land values is very site specific. It depends on the country, the location within a country, the pressures on land use, and the existing set of policies. This study acknowledges the potential importance of, but does not analyse the opportunity cost of non-agriculture uses for agricultural land.

Assessing the impact of policies

Clearly, the degree to which policies affect asset values, in particular land is dependent on the complex interplay of national and regional policies and regulations. Annex 1 to this report provides a flavour of the rich menu of interacting policies for a selected number of country cases. The challenge is to move from specific situations to a framework that permits systematic cross-country comparisons and yields general conclusions.

Table 4.1 summarizes a framework to guide the assessment of the different types of agriculture-related policies (*ceteris paribus*). The first column groups policies by categories. The second, third and fourth columns indicates the likely direction of the impact on asset allocation and asset mobility. The fifth column briefly outlines the potential impact of such policies on agricultural land values. Where possible the direction of impact is indicated based on first principles (Chapter 2 and Annex 1).

The first category of policies comprises those that are measured by the PSE. Most of these policies influence asset values, whether directly or indirectly, allocation and asset mobility between different activities within agriculture. These policies can be directly incorporated into standard model analysis. As illustrated in Chapter 2 using the PEM, policy experiments can be made by changing the level of government support and then evaluating the impact on variables such as production, income, land rents, etc. In many cases the policy experiment can be done in a relatively straightforward manner, and the model can be taken “as is”. However, where a policy has an impact on the production technology, the assumptions for parameter values may need to be considered. This is the case for some categories of input payments, and for production quotas⁴.

The second category groups together tax policies. Many of these give special advantages to agriculture, and therefore influence mainly asset mobility between agriculture and non-agriculture uses. Some, such as those concerning inheritance, relate to asset mobility between different owners. To the extent that tax concessions bestow favourable treatment on agricultural incomes or assets compared to incomes or assets in other sectors, they will tend to increase asset (mainly land) values also. Generally the coverage of such policies in the PSE database is very limited. Most, if not all, of these policies are difficult to measure. Tax policies are extremely complex and varied depending on the country, and even between regions within a country. Converting these policies into a monetary equivalent implies very demanding data requirements, and in practice only a small number of OECD countries attempt this on a systematic basis.

The third category consists of regulations on agricultural land use, transfer and sales. Some of these policies (*e.g.* zoning) influence asset mobility between agriculture and non-agriculture uses. Others (*e.g.* purchase and sales) relate to asset mobility between owners. Many of these policies are not directly measurable in monetary terms. Payments conditional on specific production practices, such as environmental cross-compliance, are an exception in that payments can be measured; however the cross-compliance requirements are not easily measurable. Other environmental policies, such as restrictions on input or land use also have an impact on production decisions between different agricultural activities. However, assessing how environmental policies impact on agricultural production is not straightforward –for example environmental conditions are very site specific. Clearly details on the implementation criteria would be crucial⁵.

Table 4.1. Summary of policies and implications for land

Policy	Impact on land		Impact on agricultural land values
	Allocation between agricultural activities	Mobility between asset owners Mobility between agriculture vs. non-agriculture	
1. Agriculture Policies			
Price support and output payments	-		Commodity support increases profitability and therefore increases agricultural land values
Area payments	-		To the extent support is tied to land, will be capitalised into agricultural land values
Production limits (quota)	-		Quota policies (captured in MPS), increases asset values, particularly rights to production
Historical entitlements	+/-		If support policies tied to land, will be capitalised into agricultural land values
Input payments	+/-		Input support increases profitability and therefore increases agricultural land values
Environmental payments			
Setting-up of young farmers		+	May increase agricultural land values if policy increases demand for land
Payments for early retirement		+	Impact on agricultural land values not clear
2. Tax Policies with preferential conditions for agriculture			
Capital gains		-	Increases profitability of agriculture and therefore increases agricultural land values
Income		-	Increases profitability of agriculture and therefore increases agricultural land values
Inheritance		-	Impact on land value not clear
Property		-	Increases profitability of agriculture and therefore increases agricultural land values
3. Regulatory Measures			
Zoning		-	Decreases agricultural land values
Purchase and sales of agricultural land, inheritance		+/-	Impact on agricultural land values not clear
Environmental cross-compliance or restrictions	-		Decreases agricultural land values

- Decreases mobility.

+ Increases mobility.

+/- Impact on mobility depends on the details of how the policy is implemented.

The sheer variety and complexity of different types of policies in the third category makes it difficult to evaluate and compare them across countries. In contrast to most types of financial support directly provided to agricultural production, which in general can be converted into expenditure terms as in the PSE, there is usually no common basis that can be used to measure the “quantity” of such policies. Even in instances where an appropriate measure of the policies can be established, there are few empirical studies providing estimates that may be used in analysis using quantitative models;⁶ Moreover, their impact on agriculture usually cannot be directly observed through market prices of outputs or factors of production.

The discussion that follows describes in broad terms the current situation in OECD countries for each of the three policy categories described above.

Agriculture Policies

As outlined in the theoretical framework (Chapter 2), the production and trade impact of policies directly provided to agriculture through commodity specific programs is well understood. Market price support, output support, production limits and payments based on area or animal numbers all have their first incidence on production decisions through their influence on relative profitability for the commodities concerned. These policies distort the allocation of resources within agriculture and they may reduce land mobility between different agriculture activities. Land values are increased to the extent that policies enhance farm profitability or are directly tied to the use of land.

Production limits

Supply control, through quotas or production rights, is an agricultural policy tool used in some OECD countries. The theoretical framework with respect to supply control in dairy products and the long-run effects on farm assets is well known in the agricultural economics literature (see, for example, OECD 2005a).⁷ Supply control is applied to a number of commodities in OECD countries – examples include dairy and sugar in the European Union, dairy and poultry in Canada, and, in the recent past, tobacco in the United States.

By limiting supply and raising domestic prices higher than would otherwise have prevailed in the absence of the policy, producers in the domestic market benefit from higher returns. Simultaneously, border measures such as tariffs on imports are necessary to prevent entry of lower priced product from foreign markets. The difference between the higher domestic price and the equivalent import price is measured by the market price support element of the PSE. The value of the quota, which reflects the difference between the market price of output and the opportunity cost of production, becomes incorporated into the cost of production. As a result a significant share of the benefits of supply control is capitalized into the value of the quota. In the context of the analytical framework presented in Chapter 2, supply control is a special case where a new fixed (perfectly inelastic) production factor (quota) has been created. Land mobility is reduced to the extent that land is tied to production of quota commodities.

When production rights are tradable the market price reflects the capitalization of the future flow of benefits generated by ownership. The degree of capitalization depends on the expectations farmers have concerning the longevity of the policy. When production rights are not tradable support may be embedded in the value of some other asset. If the

right to produce is also tied to land, then its value will be partly reflected in the price of land. Empirical examples of the link between supply control policy and quota and/or land values have been provided in the previous OECD study on farm asset values (OECD, 1998).⁸

The owners of quota are not always the producers of the quota commodity. Even if this asset is owned by the producer, transfers of wealth to individuals outside the farm sector may take place over time through sales by retiring farmers. That is, the principal beneficiaries of quota are the first generation of owners who did not have to pay for this asset. Subsequent generations face a higher cost of entry; this can be a very significant barrier for younger producers who may have less access to credit.

Payments based on Historical Entitlements

When the right to receive payments (*i.e.* the historical entitlement) is not related to land, but only linked to having produced a particular set of outputs or having used a particular set of inputs at a historical point in time, the right is implicitly attached to the farmer. If the payment rights are not exchangeable and the farmer keeps them until retirement, this implies that the support would progressively disappear from the agricultural sector. Alternatively if the payment rights are exchangeable, the support can stay inside the agricultural sector.⁹

However, if there is any link between the historical entitlements and land, then these payments will be capitalized into farm assets and create a barrier to entry. Newcomers will have to pay a higher price to “buy” their way into the sector. On the other hand, farmers contemplating a land sale may consider the opportunity cost of giving up the entitlement to future payments. Both situations imply reduced asset mobility between owners.

The impact of historical payments depends crucially on the way specific programs are implemented. In practice historical entitlement payments often allow farmers not to produce at all, providing the land is kept in agricultural or conservation use, or to produce any of a wide range of different agricultural commodities. Land mobility between different agriculture uses within the set of permitted commodities may be increased relative to price or output based programs. However, if some agricultural activities are excluded, for example a program that covers all crops and livestock but excludes fruit and vegetable production, then land mobility is reduced between program and non-program eligible commodities.

Box 4.1. Historical Entitlements

The key to understanding the potential impact of direct payments is to observe what happens to payments at the time the land is transferred. To illustrate this, two specific examples are examined: Single Payment Scheme in the European Union, and direct payments in the United States.

Single Payment Scheme in the European Union

The 2003 CAP reform introduced a fundamental change in the way the EU supports its farm sector. The main feature of the reform is the new Single Payment Scheme (SPS) which replaces part or all of the existing premia under different Common Market Organizations (CMOs). EU member States have great flexibility in calculating the payment entitlements. They can be calculated individually on a historical basis resulting in entitlement values that differ from farm to farm. Alternatively, they can be calculated on a flat-rate regional basis, leading to uniform entitlement values within regions. Member states may also choose to implement a mix of both methods. Payment entitlements are given to operators, including tenants, but not non-farming landowners. Payments are granted where farmers have eligible hectares at their disposal to activate the appropriate number of entitlements.

Entitlements are based on historical reference amounts. Eligible area includes any type of land. Farmers receiving the single farm payment have the flexibility to produce any commodity on their land. There is no obligation to produce, but the land must be kept in good agricultural and environmental condition. Payment entitlements may be transferred, with or without land, between farmers within the same member state. Where a transfer occurs without land, the buyer has to use other eligible land to match the payment entitlement.

In the historic model, each farmer is granted entitlements corresponding to the payments received during the reference period and the number of hectares farmed which were eligible for direct payments during the reference period. Thus not all eligible land is connected to a payment entitlement.

In the regional model, payment entitlements are calculated on the basis of the sum of the payments received by farmers in the region concerned during the reference period. Regional reference amounts are then divided by the number of eligible hectares in the region to establish the value of a single entitlement. Each farmer receives a number of flat rate entitlements equal to the number of eligible hectares declared in the year of SPS introduction.

Given the potential for flexibility amongst the EU member states, the impact on asset values is likely to be very different depending on the specific implementation of the SPS. Since SPS entitlements can be traded independently of land, and not all eligible land is connected to payment entitlements, only part of the expected future value of entitlements would be expected to be reflected in the price of land.

Direct and Countercyclical payments in the United States

The Farm Security and Rural Investment Act of 2002 provides the basic legislation governing farm policy for the period 2002-07. Two key policy instruments in the crop sector, Direct Payments (DP) and Counter-Cyclical Payments (CCP) are based on past area and yields. To be eligible for these payments, farmers must have produced a program crop or used the base area for agricultural or related activities. In addition all base area must be protected from erosion, including providing sufficient cover and control of weeds.

For direct payments, operators of base acres are given a pre-determined amount of payment. Base acres are fields previously enrolled in supply management programs for main crops (wheat, corn, barley, oats, sorghum and rice in the 1996 FAIR Act, plus oilseeds and peanuts in the 2002 FSRI Act). The amount of payment varies according to field-specific historical crop production and per acre yields. Producers have nearly full planting flexibility. Some restrictions are placed on land use, mainly non-agricultural use and fruits and vegetables. Payments are made directly to operators of program acres, including tenants. Landlords may receive payments if they are leasing under a share or cash-share hybrid agreement. Program eligibility is transferable with the sale or lease of base acres (USDA, 2003).

The implementation of the Direct Payment scheme suggests that the payment rights are embedded in eligible or base acres. To receive the payment a producer must cultivate eligible area, comply with conservation, wetland and planting flexibility provisions, or idle. Therefore there is a clear link between the payments and land. Hence, the US Direct Payment system is likely to operate like a land subsidy in terms of its impact on asset capitalisation.

CCP rates are determined by current prices. The payments are therefore variable, depending on commodity market conditions. However, like direct payments, there is a clear link between the payments and land. Therefore the CCP program is also likely to operate like a land subsidy, but with variable rates. Therefore the impact of the CCP on land rents will depend on, among other things, changes in current commodity market conditions.

Input payments

Payments that restrict or modify input use have an impact on farming practices. Even if the first incidence of the policy is on inputs, the optimal mix of factors of production may be altered. As the demand for land can be affected, land rental rates (and over the long term, prices) may be affected indirectly.

The impact of a specific input policy depends crucially on the type of input, and on the implementation criteria. Land mobility between different agricultural activities may be increased or decreased and it is difficult to say a priori which effects will be the strongest.

Environmental payments

Programs that target environmental objectives can affect asset mobility in several ways. Payments made on the basis of area or historical entitlements, even if the program objectives state that these are for environmental purposes, essentially operate like a land subsidy as long as a clear link can be established between the payments and land. If the payments are made in compensation for extra costs of environmental compliance, the impact on production (and therefore potentially indirectly on land values) depends crucially on whether the payments over or under compensate.

Environmental programs that target specific input(s) or input usage can be considered to be a subset of input subsidies (or taxes). Examples include input constraints and programs to maintain good farming practices. As discussed above, the resulting change in farming practices has implications for the optimal mix of production factors, and therefore can indirectly affect asset values.

Setting-up of young farmers and subsidies for early retirement

Programs for setting-up young farmers and subsidies for early retirement are used in many OECD countries, among them Ireland,¹⁰ France, Korea, Japan and recently, Mexico. Germany has, for some time, used the retirement pension system for farmers in ways designed to improve the structure of the sector. In other countries credit on concessionary terms, capital grants, and various tax concessions relating to capital gains, stamp duties on transfers or sales and inheritance taxes are also used. The general aim is to promote structural adjustment in the sector, and these programs will tend to increase asset mobility between asset owners.

The assumption is that younger farmers will be better trained and adopt more efficient technology. Young farmer programs are usually accompanied by some training or certification. In many cases, capital aids are provided to assist new farmers to adapt to or acquire more efficient production systems, purchase farms, etc. Subsidies for early retirement mirror the program objectives of setting-up young farmers by encouraging the freeing up of land and capital from the older (likely less efficient) generation to the younger generation.

Taken together as a package, these policies may accelerate structural adjustment in the sector towards more efficient farms. Young farmer programs and early retirement programs can thus be complementary programs designed to counteract the built-in tendency of land-based payments to slow down transition towards a more dynamic and large scale agricultural sector. However, there is a possible inconsistency between the objectives of these policies –one designed to attract labour into the sector and the other to

remove labour. They should, therefore, be closely integrated both in terms of their objectives and of scheme terms and conditions.

Box 4.2. Policies that promote setting-up young farmers and early retirement

In France, young farmers have been eligible since 1973 to receive settlement aids, now co-financed by the government and the EU (and therefore available to other member states). The capital subsidy, known as “*Dotation Jeune Agriculteur*”, is given to persons between 18 and 40 who have at least a lower secondary agricultural education under the following conditions: i) to finance training, ii) to settle on a farm which is at least half of the minimum settlement area (“*Surface Minimum d’Installation*”, 25 ha), and iii) to provide work for at least 1 Family Annual Working Unit (2 300 hours per year) (Code Rural, 2000). The capital subsidy to settlement is EUR 17 950 in Less Favoured Areas (LFA) and EUR 8 000 elsewhere (MAF, 2006).

Some governments top up this program on condition that the total aid does not exceed EUR 35 900 in LFA or EUR 25 000 elsewhere. Regions can also help young farmers by covering the cost of surveyor and land purchase fees, and the costs of implementing improved production systems (up to EUR 1 000 per year during three years) (CNASEA, 2006). Young farmers can additionally benefit from subsidized loans to modernize existing assets on farms they have just acquired. The interest rate is 3.5% in LFA and 2% elsewhere, with a maximum investment sum of EUR 110 000 in LFA and EUR 95 000 elsewhere.

In member states of the European Union, the early retirement scheme, launched in 1992 and modified in 1995, is 50% financed by the EU. The scheme enables farmers to retire as early as age 55 while still receiving some income until their normal retirement age. To qualify farmers must have been head of the farm for at least ten years. The other condition is that they must transmit or sell the totality of their farm, with the exception of a 0.5 ha plot for subsistence. Farmers eligible for the scheme can keep a non-agricultural source of income, providing that it does not exceed a specific level (depending on the member state).

Tax Policies with preferential conditions for agriculture

Tax concessions to agriculture affect the levels of post-tax income of farmers and landowners relative to other groups in society. They may attract resources into agriculture or help maintain resources in agriculture that otherwise would have migrated to other activities. Tax concessions to agriculture can be seen as an additional form of subsidy. Instead of a direct budgetary expenditure, government revenue that would otherwise be due is foregone. This forgone tax revenue is commonly referred to as a tax expenditure. Currently, about half of OECD countries report tax expenditures and nine have made it a legal requirement (World Bank, 2004). However, coverage of the forms of taxation is variable and the treatment of agriculture is not always explicit.

A recent study (OECD, 2005) collected information on agriculture in taxation and social security systems. Concessions are varied and may relate to, for example, the taxation of farm incomes, of agricultural property, and inputs.¹¹ The study, based on commissioned reports and information received from national sources for 25 OECD countries, finds that concessions are widespread though not all can be exclusively interpreted as support to farmers and landowners.

Some tax concessions affect the prices of agricultural outputs or inputs. If the associated revenues foregone could be measured, their impacts on land rental values could be analyzed in ways that are analogous to output or input subsidies in the PEM model as explained in Chapter 2. Similarly a concession that exempts agricultural land from annual property taxes (or imposes a lower rate of taxation) could be treated like an area subsidy. The impacts of other types of concession are much more difficult to evaluate.

Virtually all types of tax concessions will affect the structure of the industry in the long run. Resources may be retained in agriculture that, in the absence of the concessions, would have found a more profitable use in another industry. More favourable treatment will bear on farmers' decisions to stay in the industry or act as incentives to new entrants. In particular, more land may be retained in agricultural use. For example, depending on the relative incentives, tax policies may affect the mobility of land between agriculture and forestry.

The following sections highlight the main types of tax concessions that affect agricultural asset values directly. Specific examples are provided for illustrative purposes only but are not intended to comprehensively cover the incidence of these policies in all OECD member countries.

Capital gains and income taxes

A large number of countries apply concessions or exemptions from capital gains tax for agriculture (OECD, 2005). Globally, these exemptions have some or all of the following effects: reduce mobility between agriculture and non-agriculture uses, increase mobility between owners with family ties but at the expense of mobility between owners who are not related, and favour the existing structure of agricultural enterprises. The valuation of property in the calculation for capital gains may be based on reduced rates for land in agricultural use as in Switzerland. Capital gains on the sale or transfer of farmland may be exempted from taxation as in the Netherlands, Ireland, Austria, Norway and France, subject to various conditions that favour members of the same family, or require the land to stay in agricultural use for specified periods. Deferral is permitted in Canada if the transfer involves family members. In Germany capital gains taxes are waived if the revenues from selling agricultural assets are re-invested in agriculture.

Preferential income tax regimes in agriculture increase profitability for those in the sector, and provide additional incentives for new entrants. As a result, the demand for agricultural assets is higher than it otherwise would be, reducing asset mobility between agriculture and non-agriculture. Farmers (and sometimes closely related occupational groups such as fishermen) benefit from a more favourable income tax regime in Austria, Belgium, France, Germany, Italy, Korea, Poland, Spain and the United States. Some countries permit cash basis accounting whereas most other business activities are constrained to accrual accounting. Other special regimes include the possibility to apply income averaging over several years, or special treatment for income in kind that reduces the value imputed to services or food provided by the farm and consumed in the same household. For example, rural production activities (agriculture, forestry and fisheries) in Mexico are exempt from the value added tax.

Inheritance taxes

Preferential treatment is commonly given for taxes on transfers of agricultural assets, especially on intergenerational transfers within the same family. In Japan the appraisal value for inheritance tax on farmland is much lower than for land in other uses. In Norway, the basis for inheritance taxes for land and forest properties is normally 75% of the market value. The stamp duty, which is paid on transfer of land, is reduced for transfers within the family, but this is a general rule that also applies outside agriculture. In France, high taxes on inheritances that exceed EUR 76 000 potentially encourage heirs to sell and therefore increase mobility of land outside the family. However, a partial

inheritance tax exemption is granted if the heirs create an association (*Groupeement Foncier Agricole*), whereby the successor who decides to farm on the land rents the co-heirs' share of the farmland. A large number of other countries exempt or reduce inheritance tax on farmland sometimes subject to the condition that succession occurs within the family – among these countries are Australia, Canada, Denmark, Finland, Germany, Ireland, Japan, Korea, Poland, United Kingdom, and the United States.

Preferential taxes for inheritance may be intended to prevent asset fragmentation and farm dismantling. By design they tend to favour the existing structure of farms. These concessions also influence tax planning by both present and future potential farmers intending to benefit from the special treatment. The value of the concessions may be partially capitalized in the value of land, making it perhaps more difficult for potential new entrants or for existing farmers planning to expand their operation. Therefore the overall impact may be to delay exits, raise impediments to new entrant farmers who have no family ties to existing farmers, and generally lead to decreased asset mobility in agriculture.

Annual Property taxes

Land used for agricultural production may be assessed at a lower tax rate. Or taxes may be assessed on the basis of the “value in use”, typically lower than the actual market value. A very large number of OECD countries provide this kind of concession. This is the case in Mexico, where agricultural asset tax is assessed on the basis of cadastral values. Similar concessions exist in Austria, Denmark, Finland, France, Italy, the Netherlands, Norway, Sweden Switzerland and the United Kingdom. In Korea absentee landlords pay a higher rate of property tax. In the Slovak Republic the concession favours new entrants into farming and in Poland an exemption applies to the first 100 hectares. Property taxes, typically the preserve of regional or local governments, vary widely and are therefore difficult to summarize in a national context. For example, in some counties in the United States, land that receives federal agricultural payments is also eligible for significantly lower property tax rates. Many provinces in Canada give preferential treatment to farmland, as do most states in Australia.

The most often cited explanation for concessions on property taxes is the relatively large amounts of equity held by owners of farmland. Other businesses of comparable size in terms of workforce or sales are likely to have lower levels of real estate values. Thus, asset taxes tend to in practice have a disproportionate impact on agricultural households.

Regulatory measures

The regulations governing the ownership and operation of agricultural land also vary significantly between OECD countries. Zoning restrictions and other regulations that restrict agricultural land and other assets from competing uses clearly lower the mobility of farmland. Some policies restrict the size of farmland transfer; others impose legal or institutional limits on who can buy or rent farmland.

Rules that place restrictions on how assets may be transferred, such as those that stipulate equal division of assets amongst heirs, may eventually lead to a reduction in individual farm size below an economically viable threshold. Restrictions on the size of transfer or on who can buy or rent farmland are often based on the desire to favour family farms. However, this may result in “locking-in” a cost structure that in time may be less

and less able to adapt to changing economic circumstances. In the absence of regulations that limit farm structure, smaller farms are likely to, *ceteris paribus*, consolidate into more economically efficient larger farms. This increase in capital intensity follows a trend that is evident in many OECD countries, and indeed is the natural outcome of industrial development. That is to say, a relatively stable demand for food can be supplied by an increasingly more efficient and therefore relatively smaller, albeit more capital intensive primary agricultural sector.

Zoning laws

Virtually all countries use zoning laws to limit the mobility of land between different uses. Generally, the conversion of agricultural land into another use such as housing, industry, recreation, etc., is subject to approval by local or State administration. Distinguishing land into two, or more, use-classes results in an interesting play of markets. Urban (red) use typically yields a higher return to land than agricultural or nature use (green), but society is also keen to preserve some of the “green” landscape. Zoning regulations are arguably the most important instrument to prevent “red” encroachment into the “green” space. If a farm happens to be located in an area that is destined to become ‘red’ in the future, this will increase the value of the farmland today, in anticipation of the higher price that can be fetched by selling the land in the future.

The presence of zoning restrictions, and more specifically the knowledge that the zoning may change in the future, creates an option value, or opportunity cost of selling the land now rather than waiting until the new zoning becomes known. This option value will be reflected in today’s land prices and may be a sizeable component of a farm’s asset base. Zoning into “red” and “green” creates economic winners and losers: if the land of a particular farm is destined to stay (or become) ‘green’ its value is lower than that of its counterpart who draws the “red” ticket. Some examples of zoning in OECD countries are provided below.

In France, prior to 1983, the Ministry of Agriculture was the sole decision-maker for agricultural land zoning. After this date decentralization moved this power to municipalities, each of which established their own *Plans Locaux d’Urbanisme* (PLU). Since 1999 municipal lands may also be protected by special *Zones d’Agriculture Protégée* (ZAP). While these provisions are designed to reduce the mobility of agricultural land to other uses, in practice PLUs are often modified and ZAPs are relatively rare. Municipalities are also interested in housing and industrial development in order to attract financial resources.

In Norway, the main purpose of the Land Act is to permit land resources to “be managed in a way that ensures an appropriate, varied system of use with a view to the development of the local community and with emphasis on settlement, employment and effective solutions” (Andersen, 2006). According to the Act, agriculture and forestry property cannot be divided without the consent of the Ministry of Agriculture and Food.

In Korea, several laws are applied to the use of agricultural land. The Fundamentals of National Land Act (FNLA) develops the comprehensive national plan, while the National Land Use and Plan Law (NLUPL) manages land zoning at the municipal level. Provinces and municipalities designate agricultural land that is part of the Agriculture Development Region (ADR). To convert land from the ADR to other uses, permission must be sought from the Minister of Agriculture and Forestry. This may only be

successful in special cases, for example for farmers to install processing facilities for agricultural products, to develop agricultural villages, or to build their homes.

Purchase and sales of agricultural land, inheritance

Individual property rights are well established in most OECD countries. In some countries, there are few or no restrictions on the purchase and sale of agricultural land. In France¹² and Norway, as in many other countries, the transfer of farmland is heavily regulated (Box 4.3).

Box 4.3. SAFER in France and Family Farms in Norway

In France, the transfer of farmland is regulated by the *Sociétés d'Aménagement Foncier et d'Etablissement Rural* (SAFER). SAFERs are non-profit, public organizations controlled by the State. They use three main tools:

- *An obligation for information.* Each sale must be notified to the SAFER of the administrative region. The SAFER must accept or refuse the transaction within two months. The SAFER accepts the transaction if it is not thought to be for speculative purposes. The transaction may be rejected under certain circumstances, including: the agreed price is not considered representative of market prices, a sale would imply the dismantling of a farm, or a sale would allow an established farmer to enlarge his farm to the detriment of younger farmers. In this case, the SAFER exercises its pre-emptive right to acquire the land, at the previously agreed price, on condition that the agreed price was representative of market prices.
- *Negotiation power.* The SAFER undertakes discussions with the seller and buyer to try to reach a price that is judged more in line with market prices.
- *A pre-emptive right.* This allows the SAFER to acquire the land and then find a buyer or renter who better fits the mission of the SAFER. The pre-emptive right is used only if a mutually agreeable sale cannot be reached. The seller receives the same price and conditions as originally foreseen, the only change is the buyer. This instrument is rarely employed, and most agreements are reached amicably.

Despite the effort of SAFERs to regulate the market, about 80% of the value of rural land sales (representing about 25% of the area sold, the total market accounting for about 1.3% of agricultural land) is accounted for by non-farmers. This illustrates that the principal factors that influence rural land prices are not related to agriculture policy.

In Norway the transfer of agricultural land is heavily regulated. As a result of a policy designed to preserve family farms, most transfers of farms occur inside the family. The three main laws constitute the core of this policy:

- The Concession Act regulates the sale of land. The Municipal Council takes into account factors such as price, the qualifications of the acquirer, and the interests of other settlements in the area. The Ministry of Agriculture gives guidelines for the valuation of agricultural and forestry land. Sales within the same family are not subject to this Act.
- The Land Act regulates the permissible uses for agricultural and forestry land, as well as the rules for division of land. Agriculture and forestry land cannot be divided without the consent of the Ministry of Agriculture and Food.
- The Allodian Act is an ancient Norwegian inheritance law whose purpose is to keep agriculture and forestry properties within the same family. Descendants automatically inherit the Allodial right, but an acquirer outside the family can only obtain it after having owned, lived, and operated on a farm for 20 years.

High transactions costs can contribute to low land mobility. These costs may be related to problems with the identification of land, inadequate records, land co-ownership, etc. In some countries, group ownership continues to co-exist with the private market. In Mexico social property (*Ejidots* and *Comunidades Agrarias*) or collective ownership is regulated by a complex legal structure and accounts for more than half of total land area. A complex legal structure for ownership is also found in many new member States of the European Union, although the situation is rapidly evolving. Accession to the European Union introduces an improved legal and institutional framework, and therefore should contribute to increased land mobility between alternative uses.

Complex rules and regulations often govern whether and how assets may be divided between inheritors. In Korea, the Civil Code stipulates that land and other assets must be distributed equally amongst the surviving spouse and children. In Norway, the *Allodian Act* gives the family a special legally protected right to keep agricultural property in the family's possession. In France inheritance laws, based on the Napoleonic Code, require an equal division among all the children of the deceased, but over the years, a series of measures have been developed to mitigate the negative effects that this would otherwise have on the farm structure. In both Germany and France the heir wishing to carry on the farming business may be able to compensate the other co-heirs at preferentially assessed land prices applying to agriculture. This may represent, nevertheless, significant entry costs into the sector. Overall the effects on asset mobility and asset values are extremely difficult to evaluate. In Australia, Ireland, Canada, New Zealand, the United Kingdom and the United States, there would not appear to be any restrictions on the transfer of agricultural assets to heirs.

Korea has in the past imposed restrictions on who can own agricultural land, the conditions governing transfer, sale and rent in the land market, and the maximum size of farms. These restrictions severely curtailed mobility both within the sector and between agriculture and other sectors. In recent years, many of these provisions have been relaxed or removed with a view to allowing greater mobility and improving farm structures. Recent policy reform has focused on improving the financial viability of farms by facilitating land rental markets. The limit on farm size, 10 ha within the Agriculture Development Region and 5 ha outside, was only recently abolished in 2002. Nevertheless, small family farms continue to dominate agriculture in Korea. Japan has also experienced a similar evolution in the reform of its land policy (Box 4.4).

Box 4.4. Agricultural Land Reform in Japan

In Japan, the 1952 Agricultural Land Act (ALA) played a major role in reforming the land tenure system. Land ownership, previously dominated by a small number of landlords, was made accessible to the general population through government purchase and sales. Land rental rates were set at low levels, with strong restrictions on the terms of cancellation and renewal, thus making it more attractive to farm own land. However until 1970, the maximum size farm owned by an individual was restricted to 12 hectares in Hokkaido and to an average of 3 hectares in all other prefectures. As a result, independent farmers working small plots became the norm. The ALA has since undergone several amendments relaxing the restrictions on the ownership and renting of farmland.

With economic growth and consequent urban pressure, farmland prices rose and it became increasingly difficult for farmers to expand through the purchase of land. The Agricultural Land Use Promotion Project (ALUPP) was established in 1975 to facilitate the land rental market. Rental transactions quickly surpassed purchase and sales; nevertheless, by 1995 the area of rented land accounted for only 12% of cultivated land in Japan. In 1993 the Agricultural Management Framework Reinforcement Law was enacted to promote large-scale family farming with a focus on renting farmland. Despite these numerous reforms aimed at improving the cost efficiency of farms by expanding the scale of operations, the average farm size in Japan remains small.

Environmental cross compliance and environmental restrictions

The term “cross compliance” is used to denote conditionality that links a policy measure, aiming to serve a given (primary) objective, to one or more requirements relating to a different (secondary) objective. The definition of environmental cross compliance used in this study is the conditionality that links the receipt of support payments to the fulfilment of specific requirements related to environmental objectives. Eligibility to participate in the program depends on criteria laid down as part of the primary objective, which may for example be income support. To receive payment the eligible farmer must comply with certain clearly specified and enforceable conditions relating to the secondary objective, protection or enhancement of the environment. Failure to comply with these conditions results in partial or complete withdrawal of the support payment.

In contrast, “direct compliance” through agri-environmental restrictions or conservation measures aim to improve the environment through targeted incentive payments. Eligibility for payments depends on whether the farmer satisfies clearly specified criteria that are determined as a function of the environmental objective(s). Receipt of the payment depends on direct compliance with these criteria, and the size of the payment is determined as function of the environmental objective(s). Which type of policy is more effective for achieving environmental objectives is fully discussed in OECD (2007).

Environmental cross-compliance and restrictions probably reduce asset mobility for the production factors concerned. To be binding, these policies will by definition constrain farming practices that were already or would otherwise be adopted. Profitability, and therefore market returns may be affected, with negative consequences for asset values.

Several OECD countries provide income support with environmental cross compliance provisions. In the European Union, the 1992 CAP reform replaced market price support with direct payments. One of the goals was to reduce crop production in the EU and thereby lessen water pollution by fertilizers. Agri-environmental measures permitted farmers to transform arable land into pasture. Such conversion needed to be maintained for at least five years and be followed with implementation of low stocking density on pastures. The 2003 CAP reform further decoupled support from production by removing direct links between payments and current production, subject to the cross compliance condition that land is kept in good agricultural condition. In Switzerland direct income payments subject to environmental cross compliance are available on all agricultural land, regardless of use. In the US the swampbuster and sodbuster programs provide direct payments to farmers not to cultivate land that is marginal for crop production or that is more valuable to society in its current state. Since the land was not being cropped, this specific situation sets limits to the use of vulnerable land by directly altering participants’ property rights. In Japan the Basic Plan on Food, Agriculture and Rural Areas provides support conditional on eco-friendly farming activities.

Examples of environmental restrictions can also be found in several OECD countries. The European network Natura 2000 aims to conserve biodiversity. EU member states are required to introduce measures that allow the preservation of habitats. In France this will most likely involve the creation of nature reserves. In Mexico, a number of restrictions are in place (Box 4.5) including measures related to species biodiversity, soil erosion, water quality, native vegetation and forests/tropical jungles. In Japan a survey will be

conducted in 2007 to collect information that will be used to implement “Direct Payments for the Environment”.

Box 4.5. Environmental restrictions in Mexico

In Mexico activities that might affect the environment or cause a change in the use of land must have authorization from the Secretaria de Medio Ambiente y Recursos Naturales. An impact analysis must detail actions required to minimize potential adverse effects on the environment. Regulations and restrictions related to the protection of the environment include the following:

- Forest lands cannot substitute native vegetation with commercially-exploitable species unless it can be proven that such a change will not have a negative effect on biodiversity, or that the native vegetation is of little commercial or biodiversity-related value.
- Forest land cannot be converted to another use without authorization from the Secretaria de Medio Ambiente y Recursos Naturales. Authorization is granted only if the owner can prove that the change will not endanger biodiversity or cause soil erosion, that the quality and quantity of available water will not be affected, and that the proposed use is more productive in the long term.
- Ejido land that has been declared “protected natural area” cannot be urbanized. Ejido land that contains forests or tropical jungles cannot be converted into private property.
- Authorization can be denied by the Secretaria de Medio Ambiente for activities that may cause a species to become endangered or that may affect an endangered species.

Price regulations

Price formation on land markets is sometimes subject to government regulations, and this has immediate consequences for the level of land prices and for the mobility of land between alternative uses. For example, if transaction prices are capped such they cannot exceed a certain maximum, then the capitalisation of policies into land prices will be limited.

Price regulations will tend to limit the mobility of assets between owners, since the market cannot easily match supply and demand by freely adjusting prices. The potential seller of the asset will have little incentive to sell if land prices cannot adjust in the upward direction to reflect policy capitalisation or other factors.

In addition, price regulations, like virtually all regulatory interventions in markets, will tend to lead to side effects that emerge from behaviour that seeks to circumvent the regulation. If no match between supply and demand can be found at a regulated price below the market clearing level, side payments may have to come into play to clear the market. ‘Key money’ in regulating rental housing markets is a common example of this phenomenon.

Summary

The framework proposed in this chapter categorises all forms of government support to the agriculture sector. This framework encompasses agriculture specific support, tax policies with preferential conditions for agriculture, and regulatory measures. Quantifying how these policies impact agricultural production and asset mobility is difficult and depends on the availability of appropriate data and parameters for use in analytical models.

The impact of agriculture specific support (category 1) can be quantified, as was shown in Chapter 2, using the PSE data as an input into the PEM. The impact on land rents of market price support, output support, production limits, and payments based on area or animal numbers can be analysed along with their incidence on production decisions. On the other hand, support provided on the basis of historical entitlements pose some new analytical challenges because the support is no longer tied to current production decisions. In addition, these new policies tend to be more complex –for example how a policy is applied may differ by region within a country. Therefore the details of implementation criteria are crucial.

Analysing the extent to which tax policies and regulatory measures (categories 2 and 3) have an impact on agricultural production and asset mobility is even more difficult. The measurement of policy “quantity”, in PSE units or some other yardstick is fraught with difficulties, particularly for regulatory measures. Even when data is available, quantitative analysis requires translating this information into suitable analytical frameworks and requires extensive modelling. This paper does not attempt to quantify the impact of tax policies and regulatory measures.

The five case study countries (Japan, Korea, France, Mexico, and Norway) give a flavour of the diversity in national policies that can influence the purchase and use of agricultural assets. Beyond the country case studies, it appears that many other OECD countries apply some form of preferential treatment to agriculture. On the other hand, some countries have few policies that differentiate agriculture from non-agriculture activities. Differences of approach among member countries may be due to a variety of factors, perhaps the most important of which is differences in societal preferences. Therefore countries choose their own balance depending on mix of economic and social factors. Some countries intervene extensively to assure a particular structure such as family farms, others impose few restrictions addressed at agriculture in particular.

Nevertheless, information obtained from government documents and other sources in selected OECD countries suggests that, in many cases, these policies have a significant impact on asset values and mobility. Given the eclectic nature of the information obtained, it is not possible to draw a comprehensive picture of the situation for all OECD countries even if a limited attempt has been made to include information on as many countries as possible. Therefore, the qualitative assessment presented of tax policies and regulatory measures is limited by the nature of the information on hand, and in particular may be “biased” towards the higher degree of detail available for the five case studies. This chapter shows that:

- Agriculture specific policies tend to get capitalized in farm assets, in particular land. With support increasingly being tied to land this tendency is reinforced.
- Many tax exemptions and specific provisions are tied to agriculture. These provisions tend to tilt incentives towards agriculture relative to other activities and tend to increase the value of agricultural assets. However, the impact of these policies is difficult to measure.
- On the other hand regulatory measures, in particular zoning, restrict asset mobility and may have a depressing effect on agricultural asset values.
- Inflated asset values form a barrier to entry. They may also reduce the need for less efficient producers to restructure or leave the sector.

Notes

1. Various documents and internet sites providing information on, for example, income tax rules, inheritance laws, and zoning regulations.
2. A summary of these case studies is presented in Annex 2. The choice of case study countries aims to demonstrate the diversity of policies that exist in OECD countries. The choice of countries is not intended to reflect the average or typical OECD country.
3. Non-agriculture demand for land is a vast topic in itself, and beyond the scope of this study.
4. PEM includes a sub-module to specifically deal with the problem of identifying the “underlying” supply curve for commodities subject to a production quota regime.
5. Conceptually, some environmental policies may be seen as special type of area or input subsidy (or tax), depending on the implementation criteria. Some of these may already be measured by the PSE (OECD, 2005b).
6. Sensitivity analysis could be employed to give a general assessment of how each of the elasticities affect model outcomes –however the missing link is the impact of specific policies, such as zoning requirements, on the size of the elasticities.
7. The general theory is applicable to other commodities.
8. The literature related to supply control is vast and a full discussion is beyond the scope of the present study.
9. This second case corresponds to the bond scheme system as proposed by Tangermann (1991), see also Swinbank and Tangermann (2001).
10. The policies that operate in Ireland are described in detail in OECD (2005c).
11. Tax concessions to inputs, for example fuel and fertilizer, should in principle be captured by the PSE under input subsidies respectively.
12. The farmland market in France is not representative of the European situation. The French market is heavily regulated, which plays a role in price formation –farmland prices in France are amongst the lowest in the European Union (Terres d’Europe : Le Marché Immobilier Rural 2005.
http://www.safer.fr/6-actualite/resume_MIR2005.pdf).

Chapter 5.

Policy Implications and Conclusions

Policy implications

The discussion in the previous chapter highlighted the potential influence of government policy on asset values and asset mobility. The capitalization of government support into asset values reduces asset mobility, mainly because new entrants into the sector and existing farmers wishing to expand are faced with higher asset prices, the cost of which may not be recuperated in the future if farm returns (including support) are lower. In addition a number of other policies, mainly in the form of tax rules and other regulations, can also reduce asset mobility. This further enhances the capitalization phenomenon because, as seen in the theoretical discussion (Chapter 2), the least mobile assets are the ones most likely to be associated with the benefits of government support.

Land, often the least mobile asset in agriculture, may become more expensive to purchase or rent. Even if land prices or rentals are regulated by other policies, the benefits of support may still be capitalized into other assets, such as buildings (Box 5.1) or even the creation of a new asset, such as quota rents.

Box 5.1. The “*pas de porte*” in France

In certain regions of France, particularly in the north or the *basin parisien*, there is a practice for an incoming farmer to pay the outgoing farmer an extra sum of money, either directly or indirectly, by “over-inflating” (relative to the accounting value) the price of other farm assets¹. This new asset, known as a *pas de porte*, can have considerable monetary value. The sales price of a farm as a whole entity is not determined by a single value, but is established between two values. The first is the economic value (*valeur économique*), which represents the net present value of the farm, that is to say its future profitability. The second is the capital value (*valeur patrimoniale*), which corresponds to the sum of the estimated prices of the different assets making up the farm (land, buildings, etc.) if they were sold separately (Barthélémy, 1997). The capital value is lower than the economic value -the difference is known as the *pas de porte*. A portion of the difference can be due to an underestimation of the true economic value of capital, for example equipment that is judged to have no value in accounting terms. However the value of the *pas de porte* can also be partly due to the existence of public support in that region-the more support the farm receives, the larger the *pas de porte*. An analogy can be made with lawyers or doctors when they sell their practices, where the difference is related to the value of an established clientele.

The CAP reform and the introduction of the single payment (*Droits à Paiement Unique*, DPU) will not have an effect on the economic value of the farm, but will however increase the capital value, as the DPU are marketable rights to support, and will therefore constitute an additional item that can be exchanged on the market if the farm was sold fully dismantled (Courleux, 2006). Therefore, the DPU will reduce the *pas de porte*, by making more observable the value of the existing right to support.

The consequences of inflated asset values

Inflated asset values reduce efficiency in the agriculture sector. Farmers must finance a higher initial investment and face the risk of policy changes changing the return on that investment. This creates a barrier to entry for potential new farmers. It also increases the cost of expansion by existing farmers. Consequently, the mobility of assets between different owners is reduced, further contributing to higher average cost of production in the agriculture sector.

Inflated asset values create two fundamental problems. First, the benefits of support only accrue to those who are asset owners at the time support was introduced. All later entrants receive no benefits, irrespective of whether they are tenants or new farmers who have purchased assets at higher prices. This implies that many active farmers do not receive any or only a fraction of the benefits from government support. Put another way, if the goal is to also provide support to later generations of farmers, support levels would have to be increased, further inflating asset values and completing a vicious circle – a process that cannot be continued forever. In reality, this rarely occurs, as evidenced by the generally declining trend in PSEs for most OECD countries.

Second, future reform efforts to reduce support are rendered more difficult because of the potential impact on asset values. Expectations about the level of government support in the future play an important role in the determination of asset values. When policies become capitalized into asset values, existing asset owners have vested interests, and may therefore resist future policy reform. Moreover new entrants, who must now pay a higher price that reflects government support, do not receive any of the benefits but also have an interest in seeing that support maintained.

If future support is reduced or eliminated, the issue of compensation may arise. Where compensation is judged to be necessary, it should be provided in ways that avoid the capitalisation of the compensation payments. Effective targeting to those who are affected by reform is crucial to minimizing the potential for the payments to be capitalised. As argued in OECD (2006b), it is also important to make compensation payments limited in time. This is to prevent compensation from impeding adjustment, and reflects the positive effects of the adjustment process itself.

The consequences of reduced asset mobility

In all OECD countries, the growth in productivity in the agriculture sector continues to outpace growth in demand for food. As a result, the number of farmers needed to satisfy market demand continues to decline –that is, some labour should move into other sectors. At the same time, competitive forces tend to favour larger, more efficient farms. Given the constant need for adjustment in the agricultural sector, any policy that reduces asset mobility will ultimately contribute to a farm sector that is less efficient than it otherwise could be. This is one of the reasons why governments find it difficult to engage in policy reform that reduces support to the agricultural sector.

In reaction, many countries have introduced policies designed to promote structural adjustment. Policies that assist the setting-up of young farmers and the early retirement of existing farmers can play an important role to encourage the transition to more modern production practices. However, programs to assist setting-up of young farmers also draws labour into agriculture, and may therefore prevent a more beneficial allocation of labour (in the absence of policy intervention) to other sectors.

Tax concessions in favour of activities in the agriculture sector are widely applied in OECD countries. Many of these have an impact on asset mobility, and the structure of the agriculture sector. Resources may be retained in agriculture that, in the absence of the concessions, would have found a more profitable use in another sector. More favourable treatment will bear on farmers' decisions to stay in agriculture or act as incentives to new entrants. In particular, more land may be retained in agricultural use. Asset mobility between alternative uses is reduced, leading to inflated asset prices in agriculture, with the accompanying negative consequences for efficiency and capacity to adjust to change.

Some policies appear to impede the adjustment process to more efficient agricultural production. In some countries the stated policy objective is to support family farms. Regulations that place a maximum limit on farm size are now rare; however a number of related policies governing conditions for the use and transfer of assets can effectively achieve a similar outcome. Preferential tax treatment for inter-generational transfers within the same family simultaneously preserves the existing farm structure while making it more difficult for existing farmers to expand or for new entrants to acquire assets. Regulation setting artificially low rental rates or other conditions such as the proximity of land to the prospective renter's farm can be designed to discourage land leasing. The net result of these policies may be to "lock-in" a cost structure that in time becomes less and less able to adapt to changing economic conditions. In addition, by limiting the mobility of agricultural assets, they may also increase the degree to which government support is simply capitalized into asset values.

The consequences for income distribution

The distributional impact of government support to agriculture is perhaps the key issue that arises in the context of capitalisation of support programs into farm assets. An often stated policy goal is to support income in the agricultural sector. More precisely, the goal may be to support incomes for those who are active as producers. Previous research (for example, Dewbre *et al.*, 2001) demonstrates that production based payments are an inefficient way to transfer income to producers. Since there is an incentive to increase production, in so doing farmers incur greater expenses for fertilizers, herbicides, and other production inputs. Thus some of the benefits of the program are captured by input suppliers.

A direct payment measure is more "transfer efficient" because production decisions are less distorted relative to other forms of support with a basis on current production. Nevertheless, OECD (2001) and OECD (2005d) demonstrate that even if payments are made completely independently of current production criteria, they may still impact production decisions because of wealth and risk effects. As seen in Chapter 4, the impact of direct payments on asset values depends crucially on the way specific programs are implemented.

Depending on how the program is implemented, the benefits of government support may accrue to landowners, renters, or some combination of the two. Land lease arrangements will yield a different distribution of benefits compared to a situation where the farmer owns the land himself. This distribution of revenue streams will have an impact on the valuation placed on farmland. If lease arrangements are cash-based farmers and landowners agree on the rent before production is realized. This means that landowners do not share production risk and hence do not directly benefit from government payments based on production; they can however capture some or all of the benefits by increasing the rent. Under a share lease agreement, in contrast, the shares of

the revenue that will go to each part are agreed, but the actual rent amount is known only after farmers are sure about what earnings and payments they will get. Hence, government payments are shared between the tenant farmer and the landowner. These market-institutional arrangements will obviously have an impact on the size and the rate of discounting of revenue streams, and therefore influence the value of land.

Box 5.2. Direct Payments in the United States

Direct payments account for a significant share of total U.S. federal subsidies to agriculture. Since the 1996 Fair Act, land and the eligibility to receive federal payments may be sold to individuals who are not farmers. The payments, based on land area in past production of program eligible crops, come with few restrictions on current production. One option is to not produce anything, providing the land is maintained in “good agricultural condition”, such as pasture or leaving it fallow. While most of these payments are made to farmers who continue to grow program crops, some are made to landowners who choose not to produce anything. Landowners do not have to be farmers. These payments increase the selling price of land. Some real estate agents use these payments as a selling point for potential new homebuilders –irrespective of whether they are farmers, doctors, lawyers, etc., the portion of the land that is undeveloped remains eligible for payments.

Source: Washington Post, “Farm Program Pays USD 1.3 Billion to People Who Don’t Farm”, 2 July 2006

If the goal is to support farmer’s income, policies that are capitalized into asset values are unlikely to provide the optimal outcome, because not all farmers own the land they cultivate. Wichern (2004) reports that in the year 2000, about 40 to 50% of farmland in the European Union (15 member states) was rented by farmers. This share varies widely between member states, from 18% to 81% (Table 5.1). In the United States, surveys in South Dakota and Nebraska in the mid-1980s showed that landlords received from one-quarter to one-third of government payments (USDA/ERS, 2001b). The 2002 US Census of Agriculture indicates that about 40% of agricultural land is rented.

Table 5.1 Share of rented land in %

	FADN 2001 (*2000)	Eurostat 1999-2000
Belgium	75	67
Denmark	25	25
Germany	*69	63
Greece	*37	28
Spain	33	27
France	*81	63
Ireland	18	19
Italy	38	23
Luxembourg	49	53
Netherlands	*39	28
Austria	31	21
Portugal	30	23
Finland	33	31
Sweden	48	46
United Kingdom	*39	34
EU-15	*50	41

The consequences for “Decoupling”

The evolution of agricultural policies, from programs based on production criteria to more “decoupled” direct payments may have strong implications for the capitalization of support into asset values. Depending on implementation criteria, decoupled payments can result in a higher rate of asset capitalization compared to other forms of support. If the right to receive payments can be transferred with assets such as land, then most of the benefits will end up in higher asset prices. In this situation there is a trade-off between the benefits of decoupling and the consequences of potential capitalization into asset values.

The consequent reduction in asset mobility may impede future reform efforts. Specifically those who invested in agriculture with the expectation that support would continue would have paid a higher support inclusive price. Future reforms reducing support would have negative consequences for this new generation of asset owners.²

The solution to this dilemma is to minimize the capitalisation phenomena by targeting policies to a well-defined objective³. For example if the objective is to support farmer’s income, then the implementation criteria should be tight enough to ensure that the benefits are uniquely associated with the farmer, and cannot somehow be transferred to assets. Decoupling in this manner leads to both increased market orientation and efficiency in production, while minimizing the capitalization of support into asset values.

Conclusions and policy recommendations

Governments intervene in the agricultural sector through policies that support production, income, or address externalities and public goods. They may also control the purchase and use of agricultural assets through a myriad of policies and regulations in such diverse areas as taxation, land use and environment. The combined effect of these policies can play a key role in determining the structure of farms. The theoretical framework presented in this paper illustrates how, in this context, government support to the agriculture sector may be capitalized into asset values.

Inflated asset values result in more wealth for those in the sector when the policy is introduced. However, the distribution of these benefits and the consequences on the cost structure of the industry raises a number of questions. Does the change in asset values and land prices affect the ability of the sector to adjust? Does support reach the intended beneficiaries? What are the implications for future entrants to the sector and for policy reform, particularly reform aimed at reducing the overall level of support?

The extent to which support is capitalized into asset values is crucially determined by the ease with which assets move between different economic activities. Asset mobility is determined by its intrinsic physical attributes, farming practices, as well as the set of government policies influencing its use. Thus, the same support policy may have different implications for asset values in different countries. This paper has focused on land because of its important role in agricultural production, and because it is often the least mobile farm asset, and therefore the most likely vessel into which support may become capitalised.

If capitalisation reduces asset mobility, it will reduce economic efficiency by limiting the ability of producers to utilize assets in their most productive activity. Reduced asset mobility can increase the economic cost of future reform by limiting possibilities for consolidation/rationalization or change to alternative economic activities. Increasingly,

diversification and off-farm employment opportunities are seen as crucial to the viability of rural communities.

The capitalization of agricultural support into asset values is a double-edged sword. Individuals who own farm assets clearly benefit from the additional wealth. Higher asset values also enable farmers to more easily obtain bank financing to purchase additional land or equipment. However these same increases in asset values increase the cost for new farmers wishing to enter into the sector or for existing farmers wishing to expand.

The impact that capitalization of support into asset values has on individual farmers depends on the extent to which land is owned by farmers. Many landowners do not farm; others are part-time farmers whose main economic activity is outside the agricultural sector. Therefore, when payments become part of the value of land, some of the benefits “leak” out of agriculture and are captured by these non-farming landowners. This is of particular importance in countries where a large proportion of land is not owned by those who cultivate it. In OECD countries, the share that is leased ranges from 20% to 80% of total agricultural land.

When policies become capitalised, they benefit those individuals who are in the sector when the policy is put in place. Later entrants must bear higher start-up costs which may reduce or eliminate the benefits they realise from the program. Despite this, they stand to lose in equal measure if the program is eliminated. This leads to the expectation of and demand for compensation should support be reduced in the future.

The evolution of policy in OECD countries towards direct payments may lead to higher capitalization of benefits into asset values, particularly into land values, compared to other forms of support such as output or price support. That is, the “decoupling” of support from production may lead to higher “recoupling of support” into asset values. This may increase the economic pain of future reform efforts, particularly for those who have invested on the assumption that current support policies would remain in place. Nevertheless, decoupling remains an essential part of policy reform, as it permits farmers to concentrate on producing for market needs, rather than according to what is required by government policies.

What are the lessons for future policy making? Recommendations can be made along four main lines:

- Do not introduce, if possible, new policies that result in capitalisation or reduce asset mobility. Where this is not possible, minimize the negative impact of such policies. Implement policies that are sufficiently well targeted, if possible, to only achieve the desired objective –this will at the same time minimize or eliminate the problem of capitalisation.
- Avoid open-ended payment schemes.
- Engage in policies that enhance asset mobility, either actively or passively by eliminating current measures that have reduced asset mobility, in ways that do not introduce speculative incentives. Regulations governing land use should be evaluated as to their benefits and costs.
- When implementing policy reforms that reduce support levels, compensation may be a necessary component of the package. However, if provided, it should be in a form that minimizes the capitalization of compensation payments. One way is to provide compensation directly to farmers (*e.g.* tied to labour). Compensation payments should be limited in time so that they do not become capitalised or impede timely adjustment.

NOTES

1. See Note 15 in *Projet de loi d'orientation agricole*, <http://www.senat.fr/rap/a05-050/a05-05014.html>. This example in France is not representative of EU countries.
2. Those who already owned assets when support was first introduced may further benefit when policies are further decoupled –compared to output/price/input support, more of the benefits will be concentrated into asset values. The net situation for tenants will not change. With output/price/input support some of the additional revenue went to non-land inputs, and the rest to landowners. With land-linked payments, less goes to inputs and more to land.
3. If the target is linked to asset ownership or operation, capitalization may still occur.

Annex 1.

Exposition of Theoretical Foundations For Asset Capitalisation

The impact of output price support on factors of production

The following exposition follows Floyd's approach to explain the importance of two parameters—the responsiveness of the amount of land supplied to agricultural production to its price, and the extent to which land may be substituted for other factors in the production process. While the range of policy instruments that potentially have an impact on asset values is vast, the main theoretical insights can be drawn from considering only two: output price support and land subsidy. These two policies represent how policies can affect land values both directly and indirectly. They also reflect the actual evolution of agricultural policies in many OECD countries over the last decade, where output price support has been progressively replaced by direct payments tied to land in some fashion.

The key role of factor supply elasticity: the one output-one factor case

Consider a representative farmer using one factor (which may be land) in quantity l to produce an aggregate agricultural output in quantity y , according to a given production technology ($y = f(l)$). (Annex Figure I.1). On the output market, $D_y(p_y)$ is the domestic demand while $S_y(p_y, p_l^0)$ is the initial domestic supply. Both the domestic demand and supply depend on the domestic output price p_y . The initial output supply also depends on the initial equilibrium price of the factor p_l^0 .

Assume further that output y is too small to have an impact on world markets. Hence, at initial equilibrium domestic output price is p_y^0 corresponding to the exogenous world price. The representative farmer produces quantity y^0 , which is partly consumed domestically and partly exported. On the factor market, $D_l(p_l, p_y^0)$ is the initial domestic derived demand for the factor, as a function of its own price and the initial output price, while $S_l(p_l)$ is the domestic factor supply. Two limiting cases are presented, either factor supply is perfectly inelastic in quantity l^0 (that is, l is specific to agriculture) (Panel 1.b), or perfectly elastic at price p_l^0 (Panel 1.c). In both cases, at initial equilibrium domestic demand equals domestic supply at price p_l^0 and quantity l^0 .

The introduction of output price support increases the price of the commodity to p_y^1 .¹ This output price increase is an incentive for the farmer to produce more, and the farmer would seek to produce y^1 . However, such an output supply increase requires additional factor use, depicted as a shift in the derived factor demand curve from $D_l(p_l, p_y^0)$ to $D_l(p_l, p_y^1)$. The key role of the factor supply elasticity is apparent.

When factor supply is perfectly inelastic (*i.e.* there is no additional quantity of factor available), this factor demand increase translates into a factor price increase from p_l^0 to p_l^1 (Panel 1.b). This factor price increase makes the output more costly to produce. The resulting increase in the marginal cost of y shifts of the output supply curve from $S_y(p_y, p_l^0)$ to $S_y(p_y, p_l^1)$ (Panel 1.a). The increased factor price leaves the final equilibrium output quantity unchanged at y^0 .

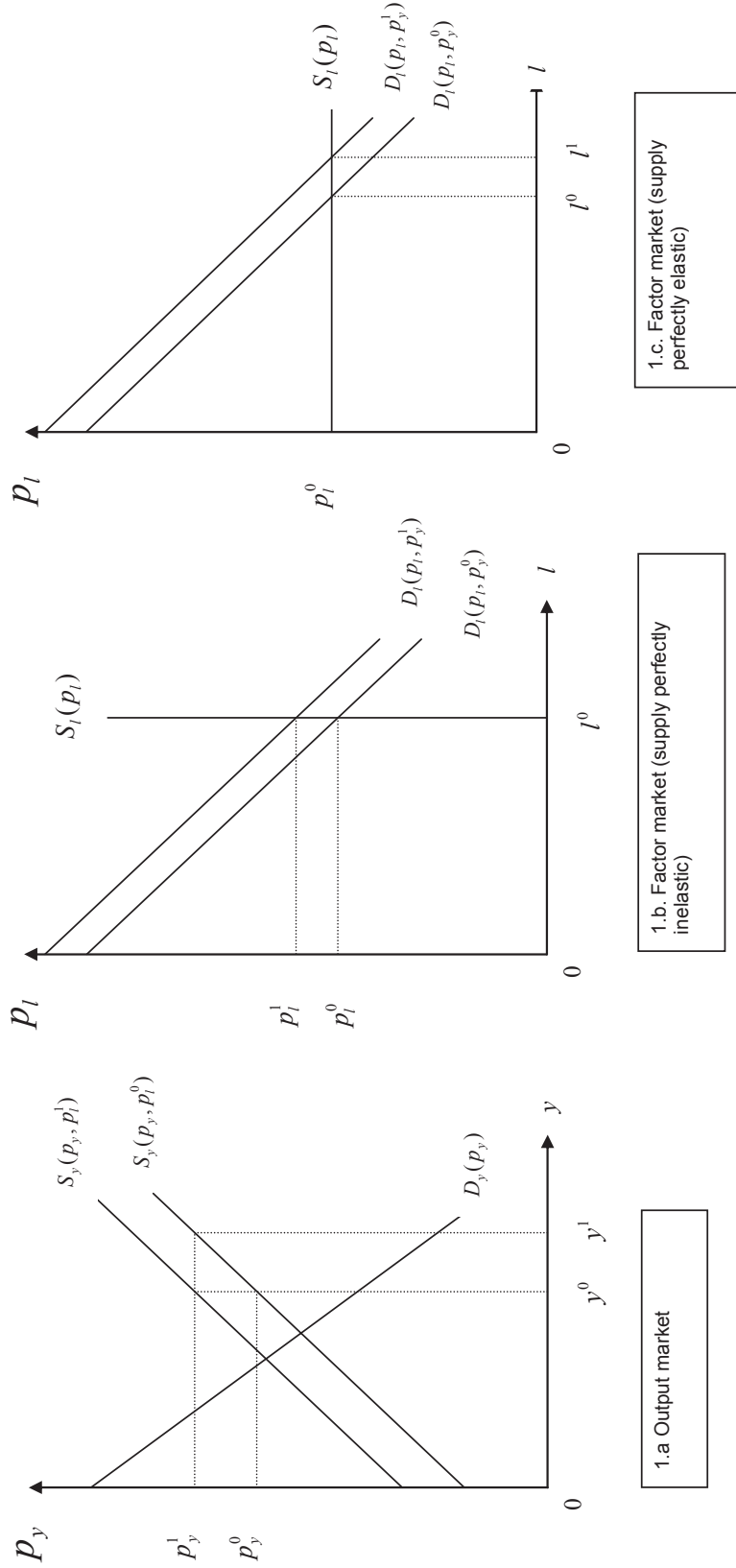
When the factor supply is perfectly elastic (*i.e.* at price p_l^0 there is no restriction on available quantity of the factor), the factor demand increase does not affect the factor price, which remains at p_l^0 level (Panel 1.c). In this case, marginal cost of y is unchanged for changes in output price. Factor demand and output supply increase simultaneously, to y^1 and l^1 respectively.

In conclusion, the effects of output price support on output and factor markets are quite different depending on the factor supply elasticity. Generalising from the two polar cases of perfectly elastic or inelastic output supply, the *more* inelastic factor supply:

- The more an increase in the price of the output is translated into an increase in the price of the factor;
- the more price support indirectly increases the production cost of the output;
- The smaller the ultimate increase in the farmer's profit as the value of support provided through the output price is transferred to the owner of the factor (who may be the farmer himself).

When factor supply is inelastic, such that output price support simply inflates input costs, the value of the output support becomes captured in the value of the inelastic factor. If the factor is land, then the value of the program is built into land rental rates, and ultimately capitalised into land price. If the owner of the factor is the farmer, then the price support policy contributes to supporting the farmer's income. Otherwise, the benefit of the price support policy leaves the agricultural sector and is captured by the non-farming landowner. Moreover, on an intergenerational basis, by increasing the cost structure of production, the price support policy increases the set-up cost for future farmers as they have to "buy" the value of the program as a condition for entry to the sector. This in turn implies that to the extent that price support is capitalised, it will benefit the individuals in the sector at the time the program is introduced more than current producers.

Annex Figure I.1. Effects of output price support on domestic output and factor markets: the one-factor case



It is commonly recognised that agricultural land supply elasticity is rather low. In other words, it is likely that in OECD countries the support provided to farmers through price support is or has been at least partially transferred to landowners and has not benefited those farmers who do not own the land they farm.²

The key role of factor supply elasticity: the one output-two factor case

Consider a representative farmer producing an aggregate agricultural output by combining two factors according to a given production technology ($y = f(l, x)$). The first factor is land and is used in quantity l . The second factor may be an aggregate of family labour and capital and is used in quantity x . Annex Figure I.2 below depicts the domestic output and factor markets.³

Land supply is assumed to increase with the rental price of land (Annex Figure I.2, panel 2.b). The domestic supply of this other factor is assumed to be perfectly elastic in p_x^0 (Panel 2.c). Output supply depends on the output price and on both factor prices (Panel 2.a). The derived demands of factors also depend on the output price and on both factor prices. Therefore, $S_y(p_y, p_l^0, p_x^0)$ is the initial output supply curve, while $D_l(p_l, p_y^0, p_x^0)$ and $D_x(p_x, p_y^0, p_l^0)$ are the initial derived demand curves of land and of the other factor respectively.

All other assumptions adopted in the previous case are retained. At the initial equilibrium the domestic output price is p_y^0 , the representative farmer produces quantity y^0 using quantity l^0 of land and quantity x^0 of the other factor. The initial rental price of land is p_l^0 , while the initial price of the other factor is p_x^0 .

Following the implementation of an output price support policy, the output price increases to p_y^1 . This output price increase is an incentive for the farmer to produce more. Other things being equal, the farmer would seek to produce y^1 . However, to increase output supply requires using higher quantities of factors. How this affects the factor markets depends on the substitution possibilities between factors.

In the case where both factors are highly substitutable an increase in their derived demand would have little impact on its initial equilibrium price, because the supply of the non-land factor x is perfectly elastic and increases in output could be produced by using more of that factor. On the other hand, if the producer wanted to increase production by using more land, this would lead to the land rental price increasing relative to its initial equilibrium level. Therefore the representative farmer who wants to increase output quantity has incentive to change the factor quantity ratio in favour of factor x , keeping land use constant. This is represented by the small upward shift (from $D_l(p_l, p_y^0, p_x^0)$ to $D_l^{sub}(p_l, p_y^1, p_x^0)$) of the derived demand of land and the large shift to the right (from $D_x(p_x, p_y^0, p_l^0)$ to $D_x^{sub}(p_x, p_y^1, p_l^{1sub})$) of the derived demand of factor x (Panels 2.b and 2.c). Hence, at final equilibrium, the farmer produces quantity y^{1sub} using quantity l^{1sub} of land and quantity x^{1sub} of the other factor. In this case, factor prices are nearly

unchanged – there is only a slight increase in the rental price of land from p_l^0 to p_l^{1sub} relative to the initial equilibrium.

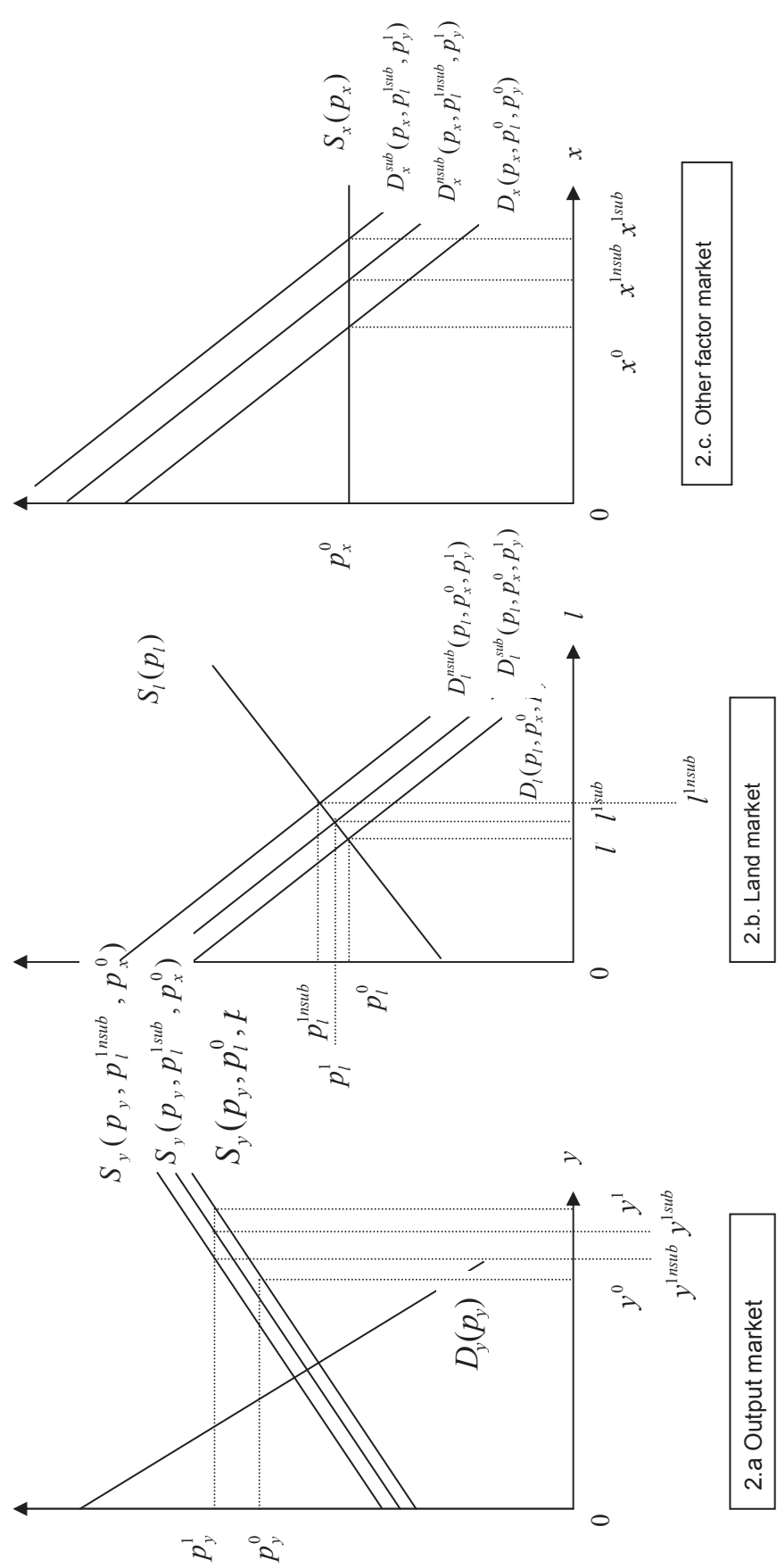
If land and the other factor have very limited substitutability, the representative farmer is more constrained in his ability to adjust the factor quantity ratio in favour of factor x . The derived demands for land and factor x shift to the right by similar amounts (from $D_l(p_l, p_y^0, p_x^0)$ to $D_l^{nsub}(p_l, p_y^1, p_x^0)$ and from $D_x(p_x, p_y^0, p_l^0)$ to $D_x^{nsub}(p_x, p_y^1, p_l^{1sub})$ respectively) (Panels 2.b and 2.c). At final equilibrium, the representative farmer produces quantity y^{1sub} (lower than y^{1sub} due to the higher increase in the rental price of land) using quantity l^{1sub} of land and quantity x^{1sub} (lower than x^{1sub} due to the lower factor substitution possibilities) of the other factor. In this case, the rental price of land increases more than in the previous situation (p_l^{1sub} is greater than p_l^{1sub}). In other words, when land and the other factor are less substitutable in production, a larger share of output price support is “capitalised” in the rental price of land.

The effects of output price support on the output and both factor markets differ according to the degree of factor substitution possibilities in production (*i.e.* the level of the elasticity of substitution between factors) on the one hand and the relative level of both factor supply elasticities on the other hand.

When a purchased factor is highly elastic in supply and land highly inelastic, then a lower substitution elasticity between the two leads to:

- A higher increase in the rental price of land and a higher the share of output price support “capitalised” in the rental price of land;
- A greater increase in the production cost of the output (and a lower effect of output price support on output quantity supplied);
- A smaller gain for the farmer in terms of increased surplus and a higher share of output price support transferred to the landowner;
- On an intergenerational basis, a bigger increase in the set-up cost for future farmers.

Annex Figure I.2. Effects of output price support on domestic output and factor markets: the two-factor case



To summarize, the impact of agricultural output price support policies on land rental markets and prices depends fundamentally on the supply price elasticities of land and other agricultural production inputs, and the elasticities of substitution in production between these factors.

The impact of a factor subsidy on factors of production

The main mechanisms by which support provided to farmers through input/factor subsidies affect farmland rental markets and prices are similar to those described previously in the case of output price support policy. That is, the key factors that determine the impact of input/factor subsidies on farmland rental markets and prices are the relative levels of supply price elasticities of inputs and factors as well as the extent of input/factor substitution possibilities in production (see, for example, Hertel, 1989; 1991; Dewbre *et al.*, 2001; Dewbre and Short, 2002; OECD, 2002; Guyomard *et al.*, 2004).

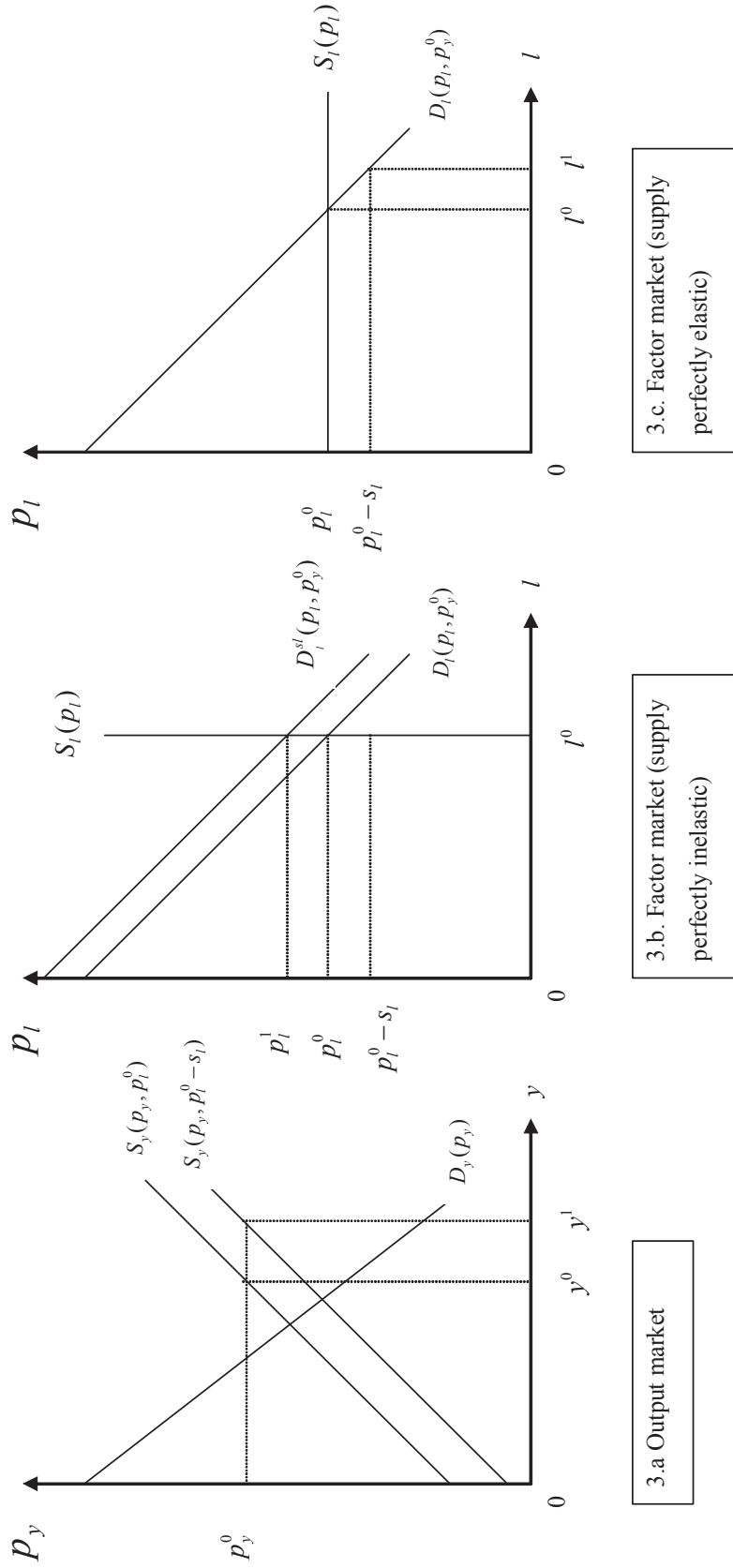
The key role of factor supply elasticity: the one output-one factor case

For the case of a factor subsidy (or a payment based on the factor use) in the single-factor framework, initially the farmer uses quantity l^0 of the factor purchased at price p_l^0 (or at opportunity cost p_l^0) and produces quantity y^0 of output that is sold at the exogenous (world) price p_y^0 (Annex Figure I3). The first incidence of the factor subsidy is to decrease the net purchase price (or the opportunity cost) of the factor for the farmer, decreasing the price of the factor “paid” by the farmer from p_l^0 to $p_l^0 - s_l$, where s_l is the factor subsidy (Panels 3.b and 3.c).⁴ The marginal cost of production declines, resulting in a downward shift of the output supply curve from $S_y(p_y, p_l^0)$ to $S_y(p_y, p_l^0 - s_l)$ (Panel 3.a). A factor subsidy generates an incentive for the farmer to increase output supply; other things being equal, the farmer would seek to produce y^1 . However, such an output supply increase requires higher factor use.

The resulting adjustments on the output and factor market differ depending on whether factor supply is inelastic or elastic (*i.e.* panel 3.b or 3.c). Where factor supply is perfectly inelastic the farmer cannot increase factor to the quantity l^1 corresponding to output quantity y^1 . The factor subsidy translates into an upward shift of the factor derived demand curve from $D_l(p_l, p_y^0)$ to $D_l^{sl}(p_l, p_y^0)$. The subsidy acts as a wedge between the supply price and the demand price of the factor, increasing the supply price (from p_l^0 to p_l^1) but ultimately leaving the demand price constant (from $p_l^0 - s_l$ to $p_l^0 = p_l^1 - s_l$). The final equilibrium output quantity y^0 remains unchanged.

In panel 3.c, where factor supply is perfectly elastic, increases in demand do not affect the supply price, so the wedge introduced by the subsidy reduced demand price while leaving supply price unchanged ($p_l^0 - s_l$ and p_l^0 respectively). Factor demand and output supply increase simultaneously, to y^1 and l^1 respectively.

Annex Figure I.3. Effects of a factor subsidy on domestic output and factor markets: the one-factor case



The effect of the factor subsidy on both the output and the factor markets depends crucially on the factor supply elasticity. Notably, the market effects of the factor subsidy are rather similar to those of the output price support as described in the previous section. For intermediate cases between those depicted here, it can be shown that a lower factor supply elasticity leads to:

- A greater part of the factor subsidy becoming translated into a higher supply price for the factor.
- A smaller final change in factor use and output.
- A smaller increase in farmer's profit is unchanged as the support provided through the factor subsidy accrues to the owner of the factor.

As was the case for output support, the factor subsidy will increase the farmer's income to the extent that the farmer owns the factors of production affected. As the factor subsidy does not increase the farmers costs (the demand price paid for the factor is at worst unchanged), there is no structural increase in farm costs of production.

Comparing Annex Figures I.1 and I.3 the impact of the two policy instruments, output price support and factor subsidy, on market adjustments and farmer's income are quite similar. This is not surprising in this simplified one output-one factor framework. Indeed, in this case if the form of the production function is known it is quite easy to transform output price support into an equivalent factor subsidy.

The key role of factor substitution: the one output-two factor case

The initial impact of the land subsidy is to decrease the demand price of land for the farmer, from p_l^0 to p_{ld}^1 (Panel 4.b). This induces an increase in demand for land (from l^0 to l^1) that, due to the relative scarcity of available land, implies an increase in the supply (rental) price of land up to p_{ls}^1 . The land subsidy generates a gap between the demand and the supply rental prices of land (*i.e.* $p_{ls}^1 - p_{ld}^1 = s_l$). Following the reduction in the net purchase price of land the farmer's marginal cost of production decreases, inducing a downward shift of the output supply curve. The magnitude of this shift depends on the substitution possibilities between land and the other factor.

When land and the other factor are highly substitutable, the land subsidy leads to a decrease in the purchase price of land and the farmer has an incentive to use more land and less factor x . Depending on the production technology, the derived demand of factor x decreases (the demand curve of factor x shifts to the left) (Panel 4.c). This decreases, the price of factor x moderating the ultimate amount of substitution between land and factor x . At the new equilibrium both derived demand curves have shifted to the left due to factor price adjustment interactions (from $D_l(p_l, p_y^0, p_x^0)$ to $D_l^{sub}(p_l, p_y^0, p_x^{1sub})$ for land and from $D_x(p_x, p_y^0, p_l^0)$ to $D_x^{sub}(p_x, p_y^0, p_{ld}^{1sub})$ for factor x) (Panels 4.b and 4.c). Both the net purchase price of land and the price of factor x have decreased. The marginal cost of production has decreased with the final output supply curve moving to $S_y^{sub}(p_y, p_{ld}^{1sub}, p_x^{1sub})$ (Panel 4.a). The land subsidy induces an

increase in output quantity from y^0 to y^{1sub} . This new equilibrium output quantity is obtained by using more land (from l^0 to l^{1sub}) and less factor x (from x^0 to x^{1sub}).

If land and the other factor are not very substitutable and land and factor x are complementary, the land subsidy leads to an initial increase in land demand and a simultaneous increase in the demand of factor x , increasing the price for factor x . This price increase moderates the increase in both factor demands, the decline in the marginal cost of production (following the decrease in the net purchase price of land) and also the expansion of output. At the new equilibrium the final output supply curve is $S_y^{nsb}(p_y, p_{ld}^{1sub}, p_x^{1sub})$ and the output quantity y^{1sub} . This is lower than y^{1sub} essentially because in contrast to the prior example (where production factors are substitutes), the complementary production relationship between land and factor x prevents the farmer from substituting cheaper land for more expensive factor x (Panel 4.a). For the same reason, the new equilibrium quantity use of land l^{1sub} is lower than in the prior example, but still higher than the initial level l^0 (Panel 4.b). More factor x is used, from x^0 to x^{1sub} (Panel 4.c).

The effect of a land subsidy on the non-land factor depends on the degree of factor substitution in production. A land subsidy may induce a decrease, no change or an increase in the quantity used and the market price of the non-land factor, depending on the production technology – whether land is a substitute or complement to the other factor (Annex Figure I.4). While the land subsidy unambiguously induces an increase in the output supply quantity, the extent of this increase depends on the degree to which land and non-land factors are substitutable — the higher the degree of substitution the greater the increase in output. The land subsidy unambiguously induces an increase in the rental market price of land, but a decrease in the corresponding net purchase price for the farmer and an increase in the quantity of land used, means the extent of these adjustments depends on the degree to which land and non-land factors are substitutable: the higher the degree of substitution the greater the increase in both the quantity of land used and the rental price of land.

The benefits of a land subsidy are potentially shared between the farmer, the landowner and the non-land factor or input supplier. Both the farmer and the landowner experience gains resulting from the decrease in the demand and increase in the supply price of land. However, their gains are greater when land and non-land factors/inputs are strong substitutes in production since in that case the benefit of support is not shared with the non-land factor/input supplier. Indeed, the non-land factor/input supplier may experience a loss as part of the profits are transferred to the farmer via the decrease in the price of the non-land factor and to the landowner via the stronger increase in derived demand on the land rental market. On the other hand, when land and non-land factors/inputs are complements in production the non-land factor/input supplier may experience a gain that reduces the benefit for the farmer and the landowner.

The impact of the land subsidy on land rental market and price can be summarized as follows. For given supply price elasticities of land and non-land factors/inputs, the higher the substitution elasticity between land and non-land factors/inputs:

- The greater the increase in the rental price of land, and hence the higher the share of support that is “capitalised” in the rental price of land;
- The greater the decrease in the production cost of the output (and the higher the positive effect of the land subsidy on output supply);
- The higher the gain for the farmer in terms of increased profit and the higher the amount of support transferred to the landowner.

Comparing the effects of output price support and the land subsidy instruments, the main insights are:

- Both instruments increase output supply. The higher the degree of substitution between land and non-land factors/inputs the greater the increase in output;
- Both instruments increase land use and the rental price of land paid to landowners;
- For output price support, the higher the degree of substitution between land and non-land factors/inputs the smaller the increase in land use and land rental prices. In contrast, for a land subsidy, the higher the degree of substitution the larger the increase in use of land and in land rental prices. The main reason for this difference lies in the differentiated first incidence of these instruments. The first incidence of the output price support instrument is to generate an incentive for the farmer to increase output supply. As expanding output requires using more factors/inputs, the impact then spreads to all factor and input markets. And the higher the degree of substitution between factors/inputs the greater the dilution of support across factors/inputs. In other words the higher the substitution possibilities the less the support concentrates on one specific factor or input (*i.e.* land). The first incidence of the land subsidy is to decrease the net purchase price of land for the farmer. The support initially concentrates on land and then spreads within the output and other factor/input markets. But the higher the substitution possibilities between land and non-land factors/inputs, the more the farmer can increase his/her land use and consequently the less the support is spread within non-land markets.

The graphical analysis does not permit conclusions about the relative effects of support given through either an output price or a land subsidy instrument. Hertel (1989), Dewbre *et al.* (2001) and Guyomard *et al.* (2004) using different frameworks (and hence different assumptions) have obtained some analytical results.

Hertel (1989), assuming constant returns to scale, perfectly elastic supplies of non-land inputs and imperfectly elastic land supply, shows that an input subsidy will have greater impact on output supply than an equal cost output subsidy, provided the subsidised input substitutes for land. The subsidised input in Hertel’s study is not land but a non-land input with a perfectly elastic supply.

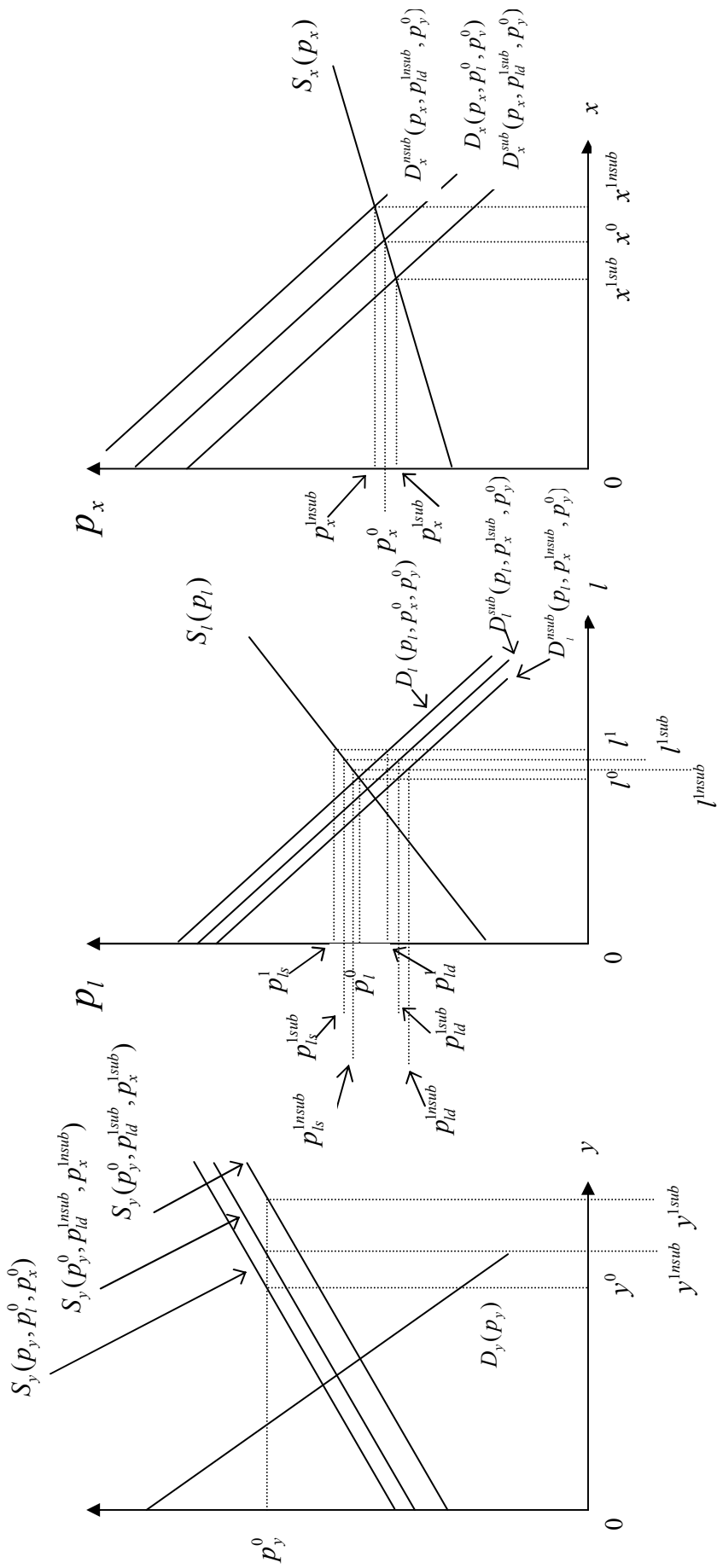
In Dewbre *et al.* (2001), the subsidy is alternatively applied to land and non-land inputs and the supply of both categories of inputs can be perfectly elastic or inelastic. Using the assumptions of constant returns to scale and a small country, Dewbre *et al.* show that market price support will have greater impact on output supply than an equal

cost land subsidy (or payment based on area) if the elasticity of supply of land is lower than that of the non-land inputs.

Using a more general framework,⁵ Guyomard *et al.* (2004) show that an output subsidy will unambiguously have greater impact on output supply than an equal cost land subsidy. They also demonstrate that an output subsidy will unambiguously have lower impact on land rental price than an equal cost land subsidy. In other words, and consistent with the intuition from the graphical analysis presented in this paper, a higher share of support is “capitalised” in the rental price of land when this support is provided through a land subsidy than through output price support.

The current evolution of agricultural policies in OECD countries is likely to reinforce the capitalisation of support into the rental price of farmland. Indeed, according to the result of Guyomard *et al.*, the “decapitalisation” of support following the decrease in support based on output should be more than counterbalanced by the intensification of capitalisation of support when newer policies are implemented on the basis of land.

Annex Figure I.4 Effects of a land subsidy on domestic output and factor markets: the two-factor case



4. a Output market

4. b. Land market

4. c. Other factor market

NOTES

1. This output price support may be provided through a fixed support price or a fixed (*ad-valorem* or specific) output subsidy. Such alternative instruments would have different impacts for domestic consumers and in terms of net welfare loss for the considered country but not for the representative farmer, nor on the factor market. As we are only interested in the farmer's situation in conjunction with the impact of output price support on the factor market, we do not specify which type of instrument is used.
2. We acknowledge that the reality is far more complex than the situation described in Figure 1 and that a great number of other factors do affect land rental price adjustment and the adjustment on agricultural output markets as well
3. As shown by Floyd, Gisser and Hertel, these results may be generalised for the multi-factor/input case, using a Cobb-Douglas or a CES production function and under the constant return to scale assumption
4. The subsidy is assumed to be of the specific form, meaning that it is a total amount per unit of factor used. This kind of subsidy is similar to and may be interpreted as a payment based on the factor use. The main results of the graphical analysis would remain valid in the case of an *ad valorem* subsidy that is a subsidy that would be defined as a percentage share of the initial equilibrium market price of the factor.
5. Without a constant returns to scale assumption, and assuming free entry and exit in the agricultural sector.

Annex 2

Summary of Country Case Studies

Summary of

Review of Policies That Affect Farmland Mobility and/or Values in France

by
Laure Latruffe and Chantal Le Mouël

Part 1. Assessment of policies affecting land mobility and/or values

Inheritance laws

Inheritance laws in France stipulate a mandatory transfer to heirs. Heirs and their entitlements are designated by law. Equal shares of the inheritance are given to the children, and it is only recently that the deceased person's spouse has been considered in the inheritance. The owner can transfer up to a maximum of 25% to anyone else. The successors can create an association (*Groupement Foncier Agricole* – GFA) whereby the successor who decides to farm on the land rents the co-heirs' share of the farmland. In this case, the GFA is eligible for a partial inheritance tax exemption, as detailed in the section describing tax measures.

Purchase and sale of land

An important policy with the potential to influence land transfer (apart from transfers through succession) pertains to the pre-emptive right. In 1960, in response to the concern that agricultural land would disappear if its sale was not regulated, the government created as part of the *Loi d'Orientation Agricole* (LOA) private bodies called *Sociétés d'Aménagement Foncier et d'Etablissement Rural* (SAFERs) to regulate the transfer of farmland. SAFERs are non-profit, public organizations controlled by the State.

To fulfil their mission, SAFERs use three main tools: (1) One tool is an obligation for information. Each sale must be notified to the SAFER of the county. When the SAFER receives the information, the price agreed to between the seller and buyer is based on market forces. The SAFER must accept or refuse the transaction within two months. Usually the SAFER accepts the transaction if it is not thought to be for speculative purposes. The transaction is rejected under certain circumstances, including if the agreed price is not considered representative of market prices, a sale implies the dismantling of a farm, or a sale allows a settled farmer to enlarge his farm to the detriment of younger farmers. If the transaction is rejected, the SAFER uses its pre-emptive right to acquire the land (see below). (2) The second tool is negotiation power. The SAFER undertakes discussions with the seller and buyer to try to reach a price that is judged more in line with market prices. (3) The third and most powerful tool, called the pre-emptive right, is

used only if a mutually agreeable sale cannot be reached. The pre-emptive right allows the SAFER to acquire the land, at the transaction price if it is not considered to be speculative (the seller receives the normal market price), and then find a buyer or renter who better fits the mission of the SAFER. The third tool is rarely employed, and most agreements are reached amicably. Despite the effort of SAFERs to regulate the market, about 80% of the value of rural land sales (25% of area) is accounted for by non-farmers, which puts an upward pressure on prices.

Legal land rental arrangements in France may play a role in land mobility. Rental contracts are defined by law through the *Statut du fermage* which aims to limit the power of the landlord and protect the farmer tenant. There are three important elements regarding rental contracts: (1) Contracts cannot be short-term. There are 9-year contracts (*Baux ruraux*), 18-year contracts (*Baux de long term*), and 25-year contracts (*Baux de carrière*). Landowners who sign a long-term contract longer than nine years benefit from a reduction of 15% of the tax on rental revenues. A landlord does not have the right to terminate the contract and rent to another tenant, however he can terminate the contract anytime if he (or his heirs) wishes to utilize the land. (2) Contracts are automatically renewed at the end of the term. At the end of the tenure, a landlord can withdraw his land only if he (or his heirs) farms the land himself for at least the next 15 years. However, a landlord rarely settles on the land and therefore the land is not likely to change hands at the end of the contract. If the landlord wishes to sell the land, the tenant has a pre-emptive right to purchase the land and the possibility to have the transaction arbitrated by the SAFER. (3) Contracts are inheritable after retirement or death, and a landlord is free to designate a new tenant only when the previous tenant did not have a successor. Therefore, there is little opportunity for land to change hands outside of the family.

The recent 2006 LOA introduces a new type of rental contract, called *Bail cessible*, which is transferable. Exiting farmers who do not have a successor in their family can choose to transfer the contract to whomever they wish. Both the tenant and landlord must agree to change the contract to a *Bail cessible*. The landlord may increase the rent when the contract is transformed; however since rental prices are regulated, the landlord may increase the price only by the maximum allowable, *i.e.* by 50%. Transferable contracts are for 18 years and therefore they will not enhance land mobility. However the fact that they do not entail compulsory renewal might increase mobility. Exiting farmers who rent their land and have a successor outside of the family, are not able to link direct payments (*Droits à Paiement Unique* – DPU) associated with the 2003 CAP reform to the rental contract, that is, to the land.

Land in France is categorized according to its use as set out by development planning provisions; as such, land devoted to agriculture is officially notified as agricultural land. Converting agricultural land into another use (such as housing, industries, recreational areas, etc.) is subject to approval by municipal governments. Municipalities establish *Plans Locaux d'Urbanisme* (PLUs) for a period of less than ten years; they map the area of PLUs and decide the main use for each plot for the period. The area of PLUs is divided into several zones according to their use: urban zones, zones to be urbanized, agricultural zones, and natural and forest zones. A PLU protects agricultural land from conversion into development. It is very difficult for landowners to change the use of their land if such a change does not comply with the municipality's map. Since 1999, municipal lands may also contain protected agricultural areas known as *Zones d'Agriculture Protégée* (ZAP).

While these provisions are aimed at reducing the mobility of agricultural land to other uses, there is a lot of uncertainty regarding the protection of agricultural land. ZAP are

relatively rare and PLUs are often modified, which threatens the existence of agricultural land. Small municipalities are particularly interested in housing and industrial development in order to attract financial resources. Agricultural land also feels pressures in tourist regions. Municipalities not only show a laxness with respect to providing building permissions, they also possess urban pre-emptive rights (*Droits de Pré-emption Urbains*) which allow them to confiscate land in their area in order to build roads, railways, and recreational activities, etc. More and more, these rights are having implications for agricultural land. About 80 000 ha of agricultural land in France are converted annually to urban uses (30 000 ha) and recreational uses (50 000 ha). The total utilized agricultural area decreased from 34.4 million ha in 1950 to 29.8 million ha in 2005. If the above policy provisions did not restrict the mobility of agricultural land to other uses to the extent that they do, the decline in agricultural area could have been much greater. The large difference between agricultural land prices and urban land prices suggests that this trend could have been more dramatic.

Conversion of agricultural land to wooded or idle land is also taking place. No restrictions are applied to such conversions; since the 1992 EU CAP reform, farmers have benefited from co-financed EU and State aid for this kind of conversion in order to reduce agricultural production. Although wooded land is not subject to property taxes whereas agricultural land is, conversion to wooded land is still marginal. Also, since 1976, EU wine producers have been given compensation for pulling out their vineyards and leaving the land idle but maintained. While these measures should increase land mobility, in practice the effect has been limited.

The EU CAP has played an important role with respect to the use of agricultural land. Support to commodities has encouraged farmers to produce greater quantities of specific crops or livestock, while compulsory set-aside has aimed to reduce production. Initially, price support was aimed to increase production in post-WWII Europe. Price support was greater for crops than for livestock, resulting in land used for pastures shifting into arable land. The 1992 reform resulted in market price support being replaced with direct payments (based on area or headage) that compensated farmers for the price cuts, and therefore the trend towards crop area use was not expected to be affected. The Agenda 2000 reforms did not significantly change the relative levels of support devoted to crops and livestock.

Compulsory set-aside was introduced with the 1992 reform. Until the 2003 CAP reform, farmers were required to put 15% of their useful agricultural area (UAA) into set-aside. For France, this resulted in an increase in the share of arable land put into set-aside from 1.3% in 1990 to 7.1% in 2005. The rate of compulsory set-aside has been fixed at 10%. Voluntary set-aside of land under good agricultural and environmental condition is also now possible, and aid per hectare under this modality is similar to that of other land; however, preliminary studies show farmers do not intend to use voluntary set-aside.

The main development in policies that may influence farmland mobility is with respect to the 2003 CAP reform, which introduces further decoupling of support from production. In France, as of 2005, direct payments (*Droits à Paiement Unique* – DPU) are being given to farmers in the form of rights, whose value and number are determined by the total support received by farmers in 2000-2002 and by their utilized area in the same period. These per hectare payments are therefore not linked to current production. Farmers may choose any kind of production on their land, or they may not produce at all provided that they keep their land in good agricultural and environmental condition. Production decisions should be based on marginal land productivity and market prices.

France has opted for the partial decoupling option, with the proportion of payments remaining coupled as follows: 25% for cereals and oilseeds; 100% for suckler cow; 40% for beef slaughter; 100% for veal slaughter; and 100% for beef.

Taxation: property, inheritance, income and capital gains

In France, high taxes on inheritance are likely to force heirs to sell their inherited estate in order to be able to pay for the tax. There is a tax-free allowance when the value of the inheritance does not exceed EUR 76 000 when the transmission is between spouses, and EUR 46 000 when it is between parents and children (and lower for other relatives). This threshold is relatively low compared to other European countries, for instance it is EUR 256 000 in Germany. The tax itself is progressive, with a rate ranging from 5% to 40% of the value of the inherited property/assets. These high inheritance taxes are likely to encourage heirs to sell the inheritance and therefore enhance the move of land outside the family. Also, in terms of inheritance, a *Groupeement Foncier Agricole* (GFA) is eligible for a partial inheritance tax exemption, up to 75% of the asset value if this value is lower than EUR 76 000 and 50% on the value beyond this.

Regarding the transfer of land outside of a succession, the main factor likely to influence the sale and purchase of land is the taxation scheme. In France, the transfer of land or property is subject to a 4.89% tax. This includes the tax for right to transfer of 3.6%, a county tax of 0.09%, and a municipality tax of 1.2%. While this rate is slightly above that of the majority of tax rates in Europe, it is still much less than it was until recently (16.2%).

Specific farmer installation and retirement measures

In France and other EU member states, an early retirement scheme that is 50% financed by the EU was launched in 1992. The scheme allows farmers to retire from the age of 55 years, while still receiving some income until their normal retirement age. In order to qualify, the farmer must have been head of the farm for at least ten years. The farmer must also transmit or sell all of his farm (with the exception of a possible 0.5 hectare plot for subsistence) within a settlement. Eligible farmers may maintain a non-agricultural income as long as it does not exceed a specified level based on the minimum average income in that county. The scheme was modified in 1995 to increase the financial aid given to early retiring farmers if they transmitted their land to new young farmers.

Since 1973, young farmers have been able to receive settlement aid, now co-financed by the government and the EU. These include: (1) A capital subsidy called the *Dotation Jeune Agriculteur* (DJA). An eligible person must be between 18 and 40 years, have at least a lower secondary agricultural education, have completed a six month internship on a farm, have followed a 40-hour training, and have settled on a farm that is at least half of the minimum settlement area (25 ha) and provides for work for at least one Family Annual Working Unit (*i.e.* 2 300 hours per year). The subsidy is EUR 17 950 in Less Favoured Areas (LFAs) and EUR 8 000 elsewhere. Regional governments may top up the DJA as long as the total aid does not exceed EUR 35 900 in LFAs or EUR 25 000 elsewhere.

Regions may also help young farmers cover the cost of surveyor fees during land purchase (up to 12% of the fees) and the costs of implementing improved production systems (up to EUR 1 000 per year during three years). To date few farmers have utilized

this aid. Young farmers may also receive subsidized loans for the modernization of assets on farms just purchased, with rates of interest of 3.5% in LFAs and 2% elsewhere and a maximum investment sum of EUR 110 000 in LFAs and EUR 95 000 elsewhere.

The settlement of young farmers is also promoted by giving incentives to exiting farmers to transmit their farm to a young farmer. Such exiting farmers can receive aid to a maximum of EUR 10 700 by farm (EUR 11 500 in mountainous regions). Studies have estimated that in 2000, 35% of young farmers settled on farms without DJA aid because they did not meet all criteria.

Environmental cross compliance/restrictions

Environmental restrictions are part of the European network Natura 2000. The network aims to conserve biodiversity and comprises two directives which became French law in 2001. One is with respect to the preservation of natural habitats and the other concerns the preservation of wild fauna and flora. The delimitation of protected sites is almost finished; these sites account for approximately 12% of French territory. Once delimitation is completed, EU Member States must introduce measures to allow the preservation of habitats. In France, this will most likely involve the creation of nature reserves; therefore farmers will probably have less freedom to choose what is produced on their land and the mobility of land between usages could be reduced.

The mission of SAFERs has been mainly to support the settlement of farmers, to support land and farm consolidation, and to favour transparency and functioning of rural land markets. However, the mission has been progressively extended to include rural development support and environmental protection. The 1999 LOA gave the right to SAFERs to use their pre-emptive right to fulfil objectives of environmental protection.

An aim of the 1992 CAP reform was to reduce crop production in the EU and lessen water pollution by fertilizers. For instance, an agri-environmental measure allows for farmers to receive aid to transform arable land into pasture. Such conversion must be maintained for at least five years and must be followed with the implementation of a low stocking density on pastures. Overall, in France, the effect of this measure has been relatively minor.

Part 2. Evaluation of significance of policies affecting land mobility and/or values

Several policies have been in place for a number of years that may have an effect on land mobility and asset values in the agriculture sector of France. Policies that have the potential to influence land transfers are very relevant in this respect. In France, these policies are mainly aimed at preventing farm dismantling and land fragmentation while supporting the settlement of young farmers. SAFERs and land rental contract arrangements play an important role in French farmland markets. Despite the effort of SAFERs to regulate the market, however, about 80% of the value of rural land sales is accounted for by non-farmers (representing 25% of area sold). Farmland rental contracts are defined by law through the *Statut du Fermage* which aims to protect farmer tenants with respect to landlords and restrain farmland mobility. Policies that protect agricultural land from competition of alternative non-agricultural uses are also relevant. While development planning or zoning provisions may reduce the mobility of agricultural land to urban usage, agricultural area is slowly decreasing in France. The EU CAP, namely the market price support system, has resulted in larger land area being devoted to arable crops

in France to the detriment of fodder and pasture utilization. In the case of France, the 2003 CAP reform has resulted in only partial decoupling of direct payments from production, and therefore market forces could have less influence on shifting production out of crops to other uses.

The French agriculture sector has been given special treatment under a number of policies that may influence land mobility and values. Policies relevant to land markets include those related to agricultural land transfer, rental, development planning and zoning. Measures to promote installation of young farmers and early retirement potentially increase asset mobility within the sector.

Summary of

Review of Policies That Affect Land Mobility and/or Values in Japan

by
Takeshi Fujie

Part 1. Assessment of policies affecting land and/or values

Inheritance laws

Inheritance laws *per se* are not discussed in this paper. See section (3) below regarding inheritance taxation.

Purchase and sale of land

Prior to WWII, a landlord-tenant farming system was in place in Japan whereby farmland was owned by few landlords who rented land to many tenant farmers. However, with post-war agricultural reforms, independent farmers working small plots became the norm and landlord holdings also became small. The government achieved this by purchasing farmland and then selling it to tenant farmers. The implementation of the 1952 Agricultural Land Act (ALA) played a major role in the reforms. The main features of the original ALA included the protection of the rights of farmers in terms of the ownership of farmland, regulation of land rent, and the authorization of the cancellation of farmland rental contracts by prefectural governors.

The first Article of the ALA stated “It is most appropriate for the farmer himself to own the land being farmed.” The stipulated farm rents were set at extremely low levels, and there were strong restrictions on the cancellation of rental contracts and on the refusal to renew such contracts. Individual ownership of farmland was also limited: no more than 12 ha of land in Hokkaido and no more than an average of 3 ha in any other prefecture of Japan.

However the ALA reduced the mobility of farmland, and was a factor in preventing the effective use of assets and limiting productivity and scale. With the high level of post-war economic growth, salary standards in non-farm sectors were increasing and hence the government shifted its focus to agricultural policies that might balance the farm and non-farm incomes. Agriculture in Japan had experienced dramatic structural changes, including a shift in labour from agriculture to manufacturing, and new agricultural equipment and other forms of technological progress. These changes required an increase in the scale of agricultural management, and it became necessary to introduce new farmland law systems that would enable greater mobility of farmland. It was not possible

to respond to these demands, however, under an ALA that emphasized only the form of farmland ownership.

The Agricultural Law was implemented in 1961 to improve farm incomes by expanding the scale of farm management, and other structural improvements. The ALA was amended in 1962 to relax the upper limit restrictions on farmland ownership and to permit agricultural production legal persons, such as co-operatives, private companies, and limited partnerships, to own farmland. In 1970, the ALA was further amended to rescind farm rent controls and abolish the upper limits on land area holdings. Although the controls on farm rent were no longer in effect, standard farm rents had been established, and if the actual farm rent exceeded these standards by a significant amount, the agricultural committee in each municipality could recommend that the rent be reduced. The ALA was amended again a number of times during the past decades in an effort to increase the mobility of farmland. While the fundamental approach of emphasizing ownership by the farmer has remained in place, amendments have shown an awareness of the need for the rental of farmland in order to increase land mobility.

With the economic growth, farmland prices rose and it became increasingly difficult to achieve an expansion in scale through the purchase of land. The government thus implemented measures to promote rental transactions in order to increase land mobility. Based on the 1968 City Planning Law and the 1969 Agricultural Promotion Areas Law (APAL), farmland was grouped into three areas: urbanization promotion areas, urbanization-restricted areas, and arable land zones. Conversion of farmland was restricted in all areas except urbanization promotion areas. The APAL was amended in 1975 and the Agricultural Land Use Promotion Project (ALUPP) was established to allow municipalities to provide mediation in the rental of farmland. Once agreement is reached between the landlord and tenant, the municipality lays out a plan for the two parties and a contract is established which is exempt from application of the ALA. Therefore, farmland rental under the ALUPP is exempt from restrictions on dissolving contracts, and the landlord is assured the farmland will be returned once the contract expires.

Prior to 1975, almost no changes in farmland use resulted from rentals; however following the implementation of the ALUPP, farmland transactions occurring through rentals surpassed those taking place through buying and selling. As scale economy became more important, the accumulation of farmland through renting became focused on larger operations. In 1980, the ALUPP was split from the Agricultural Promotion Areas Law to become the Agricultural Land Use Promotion Law, marking an entrenchment of mobility of farmland through renting. In 1993, the Agricultural Land Use Promotion Law was amended to the Agricultural Management Framework Reinforcement Law, a framework for promoting large-scale family farming with a focus on renting farmland. This framework is still in place.

By 1991, of the approximately 56 000 ha of rental farmland, only some 6 500 ha were subject to the ALA. However in 1995, the area of rented farmland in Japan accounted for still only 12% of all cultivated land. Despite reforms to Japan's agricultural land use policies, there has not been a significant increase in farmland mobility.

Other agriculture measures influence the farmland market. Under the New Basic Plan on Food, Agriculture and Rural Areas, income support measures are being introduced in 2007 to ensure stable management across a group of agricultural commodities. However, ineligible farmers (*i.e.* those holding farms below a certain size) cultivating crops that carry high risks in terms of harvest volumes, such as wheat and soy beans, might actually have to shift to other, lower risk crops such as rice, or retire from farming. In addition to

income support, price and production adjustment policies also influence farmland markets. Until the abolition of the Food Control Law in 1995, movement in the price of rice in Japan was based on a producer's price determined by the government. The government purchased all rice for sale by farmers, and the price of rice never fell below the government-determined level. Production adjustments were also in place to counter excess production. These production adjustments prevented full-time farmers from expanding, but preserved small-scale farmers who were producing rice in their spare time. This contributed to the accumulation of small-scale farmers and brought about a reduction in the supply and mobility of farmland. Price maintenance policies and production adjustment policies that were introduced to relieve the comparatively weak position of agriculture have actually resulted in a rapid increase in farmland rent and impeded the expansion of farm scale.

Taxation: property, inheritance, income and capital gains

The Continuous Long-term Farming System (CLFS) of 1968 was put in place to allow land within urbanization promotion areas to be taxed as farmland rather than residential land, as long as the farmer intends to continue working the land for many years. If the farm continues for more than 20 years, the land can be inherited at a low appraisal value and benefit from substantial exemptions on inheritance taxes as farmland. With the CLFS, the merits of owning farmland have hindered its sale. By the 1990s, there was a need to create residential areas by transforming farmland around large cities. And in 1991, the CLFS was abolished in the three largest cities.

The Production Green Land Law of 1974 aimed to preserve farmland remaining in urbanization promotion areas as part of the living environment and for public facilities. Under the amended Law of 1992, farmland measuring 500 m² or more is designated as a “productive green zone” and is taxed as farmland; but 30 years after this designation, the owner can apply to the municipality to have the farmland purchased at the current land price. If the municipality does not purchase the land or succeed in the mediation of its sale within three months, the land can be resold or converted to other uses.

For farmland outside of urbanization promotion areas, appraisal of fixed assets tax is based solely on conditions related to agricultural operations, with no consideration for the price of the land transfer. The standard taxation rate is 1.4%, and therefore the burden of fixed assets tax for farmers is low. This reduces the cost of owning farmland and likely offers a relative advantage to farmers with inefficient agricultural management. In terms of appraisals for inheritance tax, farmland is divided into four groups: farmland in urban areas, farmland in suburban areas, intermediate farmland, and pure farmland. Farmland in urban areas is often treated as farmland in urbanization promotion areas, and inheritance tax appraisals are calculated by deducting the estimated cost of reclamation for conversion to residential land from the inheritance tax appraisal value as residential land. The appraisal value for inheritance tax on farmland in suburban areas is the value estimated using the method for farmland in urban areas multiplied by 0.8. The appraisal value for intermediate farmland and pure farmland is calculated by multiplying the appraisal value for fixed assets tax by a figure stipulated by the taxation bureau for regions with similar agricultural conditions. The inheritance tax on pure farmland is considered low.

In 1973 a system of income tax on land transfers was introduced whereby taxation rates were reduced when farmland was passed on within specially designated urbanization promotion areas. In general, taxation rates in Japan for agricultural income

are similar to those in other sectors, although there are certain preferential treatments similar to those offered in other countries.

Social Security: retirement pensions

Pensions in Japan are comprised of two groups: the basic pension (National Pension) and the Public Pension. Under the basic pension, the same service is provided to all citizens, whether farmer or non-farmer. Participation in the Public Pension is limited to certain employees, including farmers in the Farmers' Pension Fund. Under the Farmers' Pension system, existing or new farmers authorized by mayors are eligible for the preferential treatment. Specifically, farmers expected to be paying into the farmers' pension system for 20 years or more can make an application for special insurance premiums that are less than the standard lower limit, and can receive assistance from the government. There is no literature indicating that preferential treatment for pensions has a significant effect on the behaviour of farmers, and therefore we may infer that such treatments do not have a large effect on farmers' asset formation or land ownership behaviour. The pension system plays an important role in the accumulation of farmland through the retirement process in that stable incomes are offered to senior farmers.

Specific farmer installation measures and retirement measures

Numerous steps have been taken to address the decrease in agricultural successors. In 1986, the Agricultural Policy Council published the "Basic Directions for Agricultural Policy in the 21st Century" in order to present activities aimed at securing new entrants from other sectors. In 1987, a National New Farmer's Guide Center was established to develop programs for new farmers. In 1988, the "General Principles for Agricultural Reforms" was published, outlining three means for promoting new employment in agriculture: (1) Strengthen support policies (2) Promote agricultural employment in corporations and (3) Improve the smooth succession of management. The New Agricultural Basic Law published in 1992 discusses the strengthening of systems targeting the acceptance of new entrants. And after its publication, an Agricultural Employment Support Fund was established in 1994, and the "Special Measures Law Concerning Loans to Encourage Engagement in Agriculture by Young People" was implemented in 1995. A system was developed to offer interest-free loans to new entrants less than 65 years old. State, prefectures and municipalities have also taken up activities related to agricultural employment policies, including programs offering consultations for employment in agriculture and skills training.

Environmental cross-compliance/restrictions

The Basic Plan on Food, Agriculture and Rural Areas states that policies related to agricultural production and the environment should focus on environmental protection, and in this vein, various support to farmers should be dependent on certain criteria (*i.e.* cross-compliance). In 2005, the government established criteria for eco-friendly farming activities, and in 2007 a survey will be conducted to help implement "Direct Payments for the Environment." In 2006, principles for measures aimed at stabilizing farm income were decided, and include an outline of "Measures for conserving farmland, water, and the environment," aimed at conserving the environment, farmland, water, and other resources. Among the measures is a policy for providing support to management activities aimed at conserving the environment. This policy is comprised of conditions for

support, including requirements related to the number of farmers in a village who must work on specific farming methods.

In Japan, there is a tendency for eco-friendly farming to be undertaken by large-scale operations. Therefore, one may assume that the introduction of agri-environmental policies contributes to the growth of large-scale operations. At the same time, policies that promote eco-friendly activities by villages as a single group may influence the accumulation of farmland through leasing.

Part 2. Evaluation of significance of policies affecting land mobility and/or values

Numerous government policies have been put in place during the post-war period that have influenced land mobility and asset values to a lesser or greater extent in the Japanese agriculture sector. The shift from a landlord-tenant farming system to one in which independent farmers work their farmland was the beginning of a period of major reforms. The 1952 Agricultural Land Act (ALA) has played a crucial role in these reforms. The main features of the original ALA included the protection of the rights of farmers in terms of the ownership of farmland and the regulation of land rent. However the ALA reduced the mobility of farmland, and was a factor in preventing the effective use of assets and limiting productivity and scale. The Agricultural Basic Law was implemented in 1961 to improve farm incomes in part by expanding the scale of farm management. The ALA was amended a number of times during the past decades in an effort to increase the mobility of farmland; for instance, in 1970, farm rent controls were rescinded and the upper limits on land area holdings were abolished. While an emphasis on ownership by the farmer has remained, amendments have shown an awareness of the need for the rental of farmland in order to increase land mobility.

The Japanese agriculture sector has been given special treatment under a number of policies that influence land mobility and asset values. Agriculture policies have been the most dominant in this respect, along with policies related to taxation and land zoning; however measures related to social security and farmer installation also provide special treatment. Overall, those policies with the most influence likely include agriculture policies directed at the ownership, rental and zoning of farmland (such as the ALA and measures related to Agriculture Promotion Areas), as well as taxation policies. For instance, in 1975 the Agricultural Land Use Promotion Project (ALUPP) was established to allow municipalities to provide mediation in the rental of farmland. Following the implementation of the ALUPP, farmland transactions occurring through rentals surpassed those taking place through buying and selling; though the area of total farmland accounted for by rentals had reached only 12% in 1995. The Agricultural Management Framework Reinforcement Law was put in place in 1993, and remains till today, to promote large-scale family farming with a focus on renting farmland. With respect to preferential treatment related to taxation, for farmland outside of urbanization promotion areas, appraisal of the fixed assets tax is based on conditions related to agricultural operations rather than the price of land transfer, and the fixed assets tax is relatively low. The inheritance tax on farmland varies depending on the zoning of the farmland, and is considered low on “pure farmland.” Within the urbanization promotion areas, the Continuous Long-term Farming System (CLFS) was put in place to allow land to be taxed as farmland rather than residential land, and the land can be inherited at a low appraisal value and benefit from substantial exemptions on inheritance taxes. However, by the 1990s, due to the need to create residential areas by transforming farmland around cities, the CLFS was abolished in Japan’s three largest cities.

Summary of

Review of Policies That Affect Farmland Mobility and/or Values in Korea

by
Hong Sang Kim

Part 1. Assessment of policies affecting land mobility and/or values

Inheritance laws

According to the Civil Code of Korea, including its inheritance laws, whether an owner is a farmer or otherwise, the land and assets must be distributed equally among the surviving spouse and children. This law offers no special treatment to agriculture with respect to the inheritance of farmland and other assets. As such, no arrangements exist under these laws to help avoid the fragmentation of farmland.

The government is trying to promote full-time, large-scale farming, however most current farmers are more than 60 years old and do not have successors. A survey by the Korea Rural Community and Agricultural Corporation (KRC), a non-profit public body, shows that less than 12% of farmers have farm successors, and it is expected that most farmland will be inherited by non-farmers in the near future. The fragmentation of large scale farms resulting from inheritance will be an important policy issue in terms of structural reforms in agriculture and farm size enlargement projects.

According to the present Farmland Act, non-farmers can hold less than 1 ha of farmland when the land is acquired by inheritance or out-migration after farming for more than eight years. Under the previous Farmland Act, all farmland received by a non-farmer beyond the 1 ha had to be sold within one year. As of October 2005, however, the Farmland Act stipulates that the farmland beyond the 1 ha may be held continuously by a non-farmer as long as he leases it in whole for over five years to the KRC. The KRC then leases this land to full-time farmers. While it is important that farmland inherited by non-farmers be leased to full-time farmers, this amendment will encourage non-farmers to buy farmland.

Purchase and sale of land

The traditional landlord-tenant arrangement was abolished with the land-to-tiller principle of the Farmland Reform Act of 1949 and the first Constitution of the Republic of Korea of 1948. In 1950, the government distributed land owned by landlords to tenants and established a farmland ownership system based on farmer ownership. According to the first Farmland Act established in 1994, farmland shall not be owned by any person

unless he uses it for his own farming purposes, and only in special cases shall farmland be leased. The goal of the government has been to promote favourable conditions for family farm units.

The Farmland Act has played the most important role in farmland ownership and leasing, and as such farmland mobility and asset value. Under the original Farmland Act, farmland could not be subdivided into lots less than 1 000 m² to prevent fragmentation of farmland, and aggregation of farmland also could not exceed 3 ha outside the Agriculture Development Region (ADR) and 10 ha inside the ADR in order to avoid excessive concentration of farmland. Owners must reside within a 20 km radius of their farmland, in order to promote efficient farming and consolidate the social structure in rural communities while preventing speculative farmland ownership by the urban rich.

The Korean government has tried to relax the many policies that restrict the sale and leasing of farmland in order to address the realities of a changing socio-economic environment. The Farmland Lease Act of 1986 was implemented in 1990 to allow legalized tenancy, as well as the ownership of less than 1 ha of farmland by non-farmers if the land is acquired by inheritance or out-migration after farming for more than eight years. The main contents of the Farmland Lease Act were merged with the Farmland Act in 1994. As mentioned under (1), as of 2005, if a non-farmer purchases more than 1 ha, he no longer must sell it within 1 year; instead, if he chooses to hold farmland for more than the year, he must lease it for over five years to the KRC, which in turn leases the land to full-time farmers.

In 1990, the Framework Act on Agriculture and the Rural Community was revised to allow farmland to be owned by an agricultural corporation under the conditions that investment by farmers represented at least half of the total investment, the representative of the corporation is a farmer, and more than half of the executive board are farmers. In 2003, the Farmland Act was further revised to allow non-farmers to own up to 1 000 m² for the purpose of farming during weekends or for leisure.

In 1993, the farm size limit was increased from 3 to 10 ha within the Agriculture Development Region (ADR); however with permission from the country head, farmers could own 20 ha inside the ADR. The ADR is designated by municipalities and provinces according to the Farmland Act; within the ADR, conversion of farmland to non-agricultural uses is prohibited. In 1999, the limit outside the ADR was increased from 3 to 5 ha. In 2002, the limit on farm size was abolished both inside and outside the ADR, and now farmers may own farmland without any size limitations.

There are many laws related to agricultural land use including the Farmland Act, the Fundamentals of National Land Act (FNLA), and the National Land Use and Plan Law (NLUPL). The FNLA concerns the national land comprehensive development plan, while the NLUPL is related to the zoning of land at the municipal level. The FNLA and NLUPL are the most important instruments for preserving farmland in Korea, and the Farmland Act provides procedures for the conversion of farmland. In order to divert the use of farmland from the ADR, permission must be granted from the Minister of Agriculture and Forestry. This may occur only in special cases. Favourable treatment is given to farmers, for instance, to install processing facilities for agricultural products, to develop agricultural villages, or to build their homes.

Overall, there are four categories of land use areas: municipal; management; agricultural and forestry; and nature and environment preservation. A large portion of land within the ADR falls under the agriculture and forestry area; however about 50%

falls under the management area as semi-agricultural and forestry lands. Single housing is allowed in all areas, however multiple housing is not allowed in the agricultural and forestry area. Most usages are allowed in the management area, and therefore landowners prefer that their land be categorized under this area where the value of their farmland would be higher.

The government began a reorganization of the land use and management system in 2003 (to be completed in 2007), to promote more efficient and sustainable land use management. An important element of the reorganization is the division of the management area into three sub-areas: planning; productive; and preservation. In planning management areas, land can be converted to other usages more easily than in the other two sub-areas. Productive management areas will be managed like agricultural and forestry area, while preservation management areas will be managed like nature and environment preservation areas. Most municipalities hope to expand planning management areas, which can be developed more easily for non-agricultural purposes. Price levels are expected to differ across the three sub-areas. This conversion of land use areas will significantly affect asset values and farmland mobility. The value of land increases when agricultural land is converted to land for non-agricultural purposes.

Regulation of farmland use affects farmland prices, which in turn influences farmland mobility. Studies have shown that farmland prices do not closely follow changes in agricultural product prices. However, other factors do play important roles in determining farmland prices, such as the profitability of farming, and non-agricultural demands for farmland. Non-agricultural demand is stronger outside of the ADR than inside the ADR, which puts upward pressure on farmland prices outside of the ADR. The farmland price gap between the ADR and non-ADR is substantial for land that can be easily converted to non-agricultural sites.

The responsibilities of the KRC, Korea's new farmland banking system, are extensive, and it has an important influence on the farmland market. The KRC carries out numerous projects and it may intervene in farmland markets through the acquisition, temporary holding, resale and lease of farmland. It may provide financial assistance to farmers who wish to own or rent farmland from itself or others. Its policies increase the ability of people to transfer farmland by leasing and acquisition, which enhances farmland mobility and its value.

One major KRC project is the farm size enlargement project to improve productivity and rural income by expanding farm scale and the collectivization of farmland. Under this project, farmers are provided financial support for leasing and acquiring farmland by way of low interest rates, with a focus on young, full-time rice producers. Between 1995 and 2004, the KRC had selected 84 831 rice farmers (90% of whom were under 60 years), and provided these farmers KRW 3 022 billion won in support. (Rice fields account for most Korean farmland and have been the most important asset of farmers.) Over this period, the average farm in this group increased from 2.22 ha to 4.3 ha, and the average income increased to about KRW 12 million per farm, in part due cost savings resulting from increased scale. The efficiency of agricultural management through collectivization of farmland also increased; 85% of the supported farms were adjacent (within a radius of 500 metres) to the existing farmland.

The KRC is expected to put more emphasis on long term farmland rental-leasing programs, instead of programs that provide farmers with financial support for purchasing farmland. Due to high land prices, farmers have sought to expand the scale of their farms

by leasing instead of buying. Since the market price of farmland is higher than land productivity, there is a tendency to hold land as a means of preserving its value.

In 2006, a new program is being introduced whereby the KRC will buy farmland from farmers who hold a significant level of debt. If these farmers are able to, the KRC will then lease back the farmland. This program aims to stabilize the farmland market and increase the demand for farmland among farmers.

Most agricultural support policies, such as direct payments for income preservation, raise producer incomes. Analysis shows that direct payments also put significant upward pressure on farmland rental rates and market prices. This in turn reduces the mobility of farmland. It has been forecast that the rental rate of farmland would decrease by about 36% during 2004 and 2014 if direct payments were not be implemented by the Korean government. The KRC has had difficulty managing its farm size enlargement project due to the negative effect of direct payments on (rice) farmland mobility. While direct payments may be capitalized into the price of farmland, it is difficult to separate this effect from the effect of other factors that influence farmland prices, such as the ease to which farmland can be converted to other uses, and the distance of farmland to urban areas.

Taxation: property, inheritance, income and capital gains

There are a number of tax concessions in place for farmers, including preferential treatment with respect to various property taxes (*e.g.* acquisition, registration and value), inheritance tax, and income tax. The most preferential treatment is in relation to the land value tax, transfer income tax and inheritance tax, which normally have very high tax rates. These concessions are employed to protect the family farm and to accelerate structural reforms. Farmers receive a 50% deduction on the land acquisition tax (this tax is normally 2% of assessment value), and a 50% deduction on the land registration tax (this tax is normally 1% of assessment value). A preferential assessment on the value of farmland is also provided; this assessment is about 40-70% of normal market value. Farmers are exempt from the land value tax. A deduction in income tax is also provided to farmers.

In terms of farmland transfers, there are tax deductions or exemptions provided to farmers to preserve the land-to-tiller principle and to compensate farmers for implicit losses resulting from constraints on converting farmland to other uses. In the case of inheritance, if the land is being inherited by a farmer, an exemption on the inheritance tax is provided for up to 30 000 m², and beyond this, a preferential assessment is provided on the farmland value. In other cases, if the land has been farmed for more than five years, farmers receive a tax exemption if the land is transferred to the KRC to be used in the public land program (such as the farmland utilization promotion project to accelerate structural reforms).

Social Security: retirement pensions

The social security system in Korea offers very limited coverage for farmers. Farmers became eligible for the National Pension Plan in 1998; however only very small retirement pensions are offered to older farmers under this plan. Recently, the government has started to implement policies that strengthen the social safety net in rural areas. For example, health insurance premiums have been reduced for farmers, and the government has expanded support to pension payments.

The government plans to implement policies to strengthen the social safety net in rural areas. For instance, it will lower health insurance premiums for farmers, and expand government support of pension payments.

Specific farmer installation and retirement measures

There is a trend towards farmland being devoted to specialized farmers, and market conditions are expected to become more favourable for large-scale, specialized farmers. Inefficient, small-scale farms with older operators will be replaced by specialized farms.

In coordination with market liberalization, the government is actively attempting to promote professional farmers. The KRC supports old and small scale farmers by selling farmland on their behalf, in an effort to stabilize the farmland market. With the change in policy to allow the leasing of farmland, it will be easier for farmers to retire from farming.

Under the direct payment system, as of 1997 retiring farmers may receive a subsidy for leasing their farmland to full-time farmers for a period of more than five years. This direct payment for farm management transfer has since increased. In 2003, a new policy was introduced whereby a retired farmer is entitled to KRW 241 000 Korean each month for up to eight years for each hectare of transferred farmland.

Environmental cross-compliance/restrictions

Since the Sustainable Agricultural Promotion Act entered into effect in 1998, several measures have been introduced to reduce the use of fertilizers and pesticides. A direct payment scheme for environmentally friendly farming has also been implemented. In 2003 the direct payment scheme was revised to differentiate between low chemical, chemical-free and organic products. In 2004 a new direct payment for environmentally friendly livestock practices was introduced.

Part 2. Evaluation of significance of policies affecting land mobility and/or values

Policies that affect land mobility and asset values in Korea have evolved during the post-war period, beginning with the abolition of landlord-tenant arrangements and the adoption of the land-to-tiller principle. The 1949 Farmland Reform Act and its successor the 1994 Farmland Act have had perhaps the most significant influence. The original Farmland Act stipulated that farmland shall not be owned by any person unless he uses it for his own farming purposes, and only in special cases shall farmland be leased. Over the years, Korea has implemented certain policy changes. Among the changes were the introduction of the 1986 Farmland Lease Act (merged with the Farmland Act) to allow legalized tenancy, and granting the right to non-farmers to own less than 1 ha of farmland if it is acquired by inheritance or out-migration. Recently, in 2002, the limit on farm size (of 10 ha) under the Farmland Act was abolished.

The Korean agriculture sector has been given special treatment under a number of policies that influence land mobility and asset values. A notable exception to this are policies related to social security and retirement pensions for farmers, however changes are evident in this area. Policies specific to agriculture, land zoning, and taxation offer the most significant special treatment. For instance, while the Farmland Act has been amended and non-farmers have been granted certain rights, the Act continues to promote

the full-time family farm, albeit a larger scale, more productive farm. Continued easing of policies related to ownership and leasing is expected, which will further increase farmland mobility.

Nevertheless, there is great concern with non-farmer land speculation and the government is preparing measures to address this problem, such as increases in taxes. In an effort to promote farm size enlargement and stabilize farmland markets, the Korea Rural Community and Agricultural Corporation (KRC), which administers the farmland banking system, provides farmers financial support for leasing and purchasing farmland as well as debt-relief. The Farmland Act as well as national acts related to land use and zoning are key instruments for preserving farmland. Preferential treatment is also given to agriculture through a number of tax concessions; most importantly, concessions in relation to the land value tax, transfer income tax and inheritance tax, which normally have very high tax rates.

Summary of

Review of Policies That Affect Farmland Mobility and Values in Mexico

Part 1. Assessment of policies affecting land mobility and/or values

Inheritance laws

The process of inheritance for social property is different than that of private property. According to the Mexican Constitution, agrarian subjects of social property can pass on their agrarian rights to a successor of their choice. However, successors must comply with restrictions stated in the Constitution and Agrarian Law of Mexico. For instance, an heir must become an agrarian subject and cannot inherit rights over a parcel of land when it exceeds the 5% landholding limit within an *ejido*. There can be only one successor per parcel of land, since parcels are not divisible. If an agrarian subject fails to register a list of successors, the spouse has priority in the inheritance. Should the spouse not be eligible, the land is transferred to the children. When there is disagreement among siblings, the *asamblea* must sell the land and distribute the revenue among the heirs. In a situation where there are no identifiable successors, the *asamblea* sells the land and decides how the revenue is to be used.

Purchase and sale of land

Land reform in Mexico began when the Agrarian Law was conceived in 1917 and the government began to redistribute land from large land owners to landless peasants. The expropriated land became social property, and the land distributed to peasants is known as *ejidos*. Today, *ejidos* represent about 83% of social property. Social property accounts for 53% of Mexican territory, private property accounts for 37%, and federal land and waterways account for the remaining 10%. The other 17% of social property is represented by *comunidades agrarias*, which is land that has been restored to indigenous groups. The economic activities of *ejidos* and *comunidades agrarias* are quite diversified, with about 93% of all agrarian units involved in agriculture and 74% in livestock. Some are also engaged in forestry (10%) and non-agricultural activities (22%). Social property is regulated by a complex legal structure; although it is becoming less restrictive, land mobility under this regime is still severely constrained. The private land market is similar to that of other countries which face credit constraints, and landowners under this regime make decisions in order to maximize utility.

Ejidos and *comunidades agrarias* are broadly classified as agrarian lands, and according to the original Agrarian Law, beneficiaries of these properties have had the right to use the land but have not had full ownership. *Ejidos* also include areas of

common-use land. Within *comunidades agrarias*, parcelling of land has been prohibited and the land is to be used commonly by the agrarian subjects. Overall, some 33% of social land is currently parcelled, about 65% is devoted to common use, and the remaining portion is used for dwellings, reserves and other purposes. The average area of land –including parcelled, common use and other land use– available to agrarian subjects of *ejido* is 21.7 hectares. Given the relatively small size of landholdings within *ejidos* and *comunidades agrarias*, there is incentive for agrarian units to be organized and coordinated in order to remain productive and have access to good markets. Although some *ejidos* and *comunidades agrarias* function as cooperatives and have developed agro-industries, the overall level of coordination still remains low. Only about 53% of agrarian units own warehouses or barns. The level of technology also remains low, with 7% owning a tractor and 2% owning specialized machinery.

Agrarian units are controlled by an assembly known as an *asamblea*. Among other things, an *asamblea* has authority to make decisions regarding revenue sharing, defining areas for common land use, urban use, schools, etc, and how common land is to be used. Participation in decision making can be low among agrarian subjects. As a consequence, social groups within agrarian units can be systematically excluded from access to land or other common assets.

During much of the 20th century, agrarian subjects of *ejidos* and *comunidades agrarias* faced many restrictions regarding land ownership. Agrarian subjects could not own, sell, rent or sharecrop their plots. They were also not able to hire labour. However, some reforms were introduced in the early 1990s. In 1992, the Agrarian Law and 27th Article of the Constitution – both containing provisions regarding land ownership – were modified. The first major reform was the end of new *ejidos* and *comunidades agrarias* through land redistribution by the government. Therefore, *ejidos* and *comunidades agrarias* can now be created only by landholders who voluntarily adopt agrarian rules.

The second major change was to allow *ejidos* and *comunidades agrarias* to transfer land to the private property system. To help facilitate this process, the government created the Social Land Registry and the PROCEDE program which certifies and gives title to social land. As of 2006, 82% of social property had been certified and titled. In the case of agrarian communities where there are not individual parcels, the perimeter is certified however the community is still considered common use property. Under the PROCEDE program, *ejidos* and *comunidades agrarias* may designate areas for urban use (considered private land) and build homes, schools, churches, etc., on this property. Despite the significant liberalization of the agrarian sector, very little land has been actually transferred to the private property regime. Between 1992 and 2005, the equivalent of only 3.9% of social property was converted to private property.

Current important policies pertaining to land transactions within the social property regime include the following: (1) Agrarian subjects may purchase social land from other agrarian subjects; however only individual parcels may be traded. In the case of common use land, the *asamblea* must authorize the division of the land into parcels. (2) Rental and sharecropping agreements are now allowed in *ejidos*. These agreements may be with non-agrarian subjects. (3) Agrarian subjects of *ejidos* may transfer dominion of common-resource lands to private corporations with whom they are partners; these corporations may have non-agrarian-subject partners. (4) When an agrarian subject of an *ejido* decides to sell his parcel to other agrarian subjects, his family members have the right of first refusal and one month to purchase the land. (5) When an agrarian subject of an *ejido*

decides to sell his private property parcel to an outsider, all other agrarian subjects have the right of first refusal and one month to purchase the land. (6) Agrarian subjects cannot own more than 5% of the total *ejido* area, to prevent the creation of large concentrations of land under the ownership of a minority. (7) Certified parcels cannot be divided; an agrarian subject must sell his parcel in whole and not in part to prevent the fragmentation of social property. (8) Social land cannot be used as collateral for a loan. Agrarian subjects may pledge their rights of use as collateral before a financial institution for a limited period of time; however actual ownership cannot be put forward as collateral. Therefore, should the lender have to take over the land, he could use it temporarily but could not sell it.

Even though agrarian subjects now have greater property rights, the existing restrictions imposed on social land transactions have a dampening effect on social land prices. One major challenge is the lack of access to credit, since social land cannot be used as collateral for a loan and there is little interest among commercial banks to provide loans. The risks and complexity associated with acquiring social land –either formally through an *asamblea*, or informally by means of an oral agreement with an agrarian subject– means that the non-agrarian buyer has bargaining power to lower the purchase price. This situation can be exacerbated when agrarian subjects face a medical or other emergency and feel compelled to sell at a low price.

The 2001 World Bank study of Mexican land policy and *ejido* reform found, among other things, that the legal and institutional changes introduced with the 1992 Agrarian Law and the PROCEDURE program resulted in improved land rights through formal recognition of occupancy rights for more than 1 million households, and that the functioning of land markets was greatly improved, particularly rental markets. On the other hand, no improvement was found in credit availability and little use of joint ventures was being made with private firms. The study also identified factors reducing agrarian subjects' desire to use the PROCEDURE and convert to private property: (1) the continuing prohibition of land subdivision upon inheritance (2) the lack of incentives at the local level to update the Registry and (3) the fear that information from the PROCEDURE will be used for taxation purposes, even though *ejido* land is not currently taxed. The study recommends promoting successful organization models, such as establishing joint ventures, and a pilot project for fast-tracking the PROCEDURE and conversion to private property in peri-urban areas with high land values.

Taxation: property, inheritance, income and capital gains

Compared with private property, social property is exempt from various taxes including property and inheritance taxes. For instance, most municipalities levy property taxes, however *ejido* and *comunidad agraria* lands are exempt from such taxes. Private property taxes are calculated at different rates of property value depending on the use of land, for instance: 0.218% for plots for agricultural production using gravity irrigation; 0.305% for plots for agricultural production using pump irrigation; 0.171% for plots for pasture; 0.339% for plots for aquaculture production; 0.126% for low income housing; 0.169% for middle income housing; 0.222% for upscale housing; 0.550% for urbanized plots; and 0.825% for peri-urban, non-urbanized plots. Therefore, agricultural plots can pay a higher property tax than urban plots of the same value. Urban land can have a higher price per unit than certain agricultural land, such as small agricultural holdings and pasture for livestock production. However, large irrigated landholdings can be at a disadvantage relative to urban land in this respect. There is a clear disincentive to own

peri-urban, non-urbanized land; owners of such plots would not want to leave the land idle, and would be encouraged to either change the land use to one for housing purposes or for agriculture.

For private property, there are high transaction costs associated with the transfer of property in Mexico which is likely to stifle land mobility. It is estimated that the transaction costs associated with purchasing and registering land and buildings is 5.3% of the property value in Mexico, compared with 4.8% on average in Latin America and 0.5% in the United States. In Mexico, about 82% of transaction costs is accounted for by real estate purchase taxes, and the remainder is represented by fees for notary services, certifications, and registration. However, the first sale of former *ejido* land (after conversion from social to private property) is not subject to a sales tax. In addition to purchase taxes on land transfers, the seller must pay a tax on the income generated by the sale. The purchase tax on inherited property is the same for both agricultural and non-agricultural land.

Persons and corporations involved in rural production, such as agriculture, forestry and fishing, are provided certain tax advantages related to income, value added, assets, etc. For instance: (1) A corporation is exempt from income tax if its annual income is lower than 20 times the yearly minimum wage per partner (with a limit equal to 200 times the minimum wage for Mexico City); (2) Rural production activities are exempt from the value added tax; (3) For asset tax purposes, assets can be valued at the *cadastral* value which is usually lower than the market value; and (4) Up to 20% of income can be written off as “minor expenses, temporary hired labour and cattle feeding,” without having receipts that comply with normal requirements.

Social Security: retirement pensions

A comprehensive social security system is in place in Mexico, in particular IMSS for private workers and ISSSTE for government workers. However agrarian subjects are self-employed and typically lack social protection especially for retirement and medical insurance purposes. The Land Fund and Young Rural Entrepreneurs program, discussed in section 5, offers benefits to older agrarian subjects related to pensions and medical and life insurance.

Specific farmer installation and retirement measures

The population within *ejidos* and *comunidades agrarias* is aging, with the average age of a farmer now 55 years and more than one-third of farmers older than 65 years. Younger persons are not finding economic opportunities in rural areas and are migrating to larger cities and to the United States. Older agrarian subjects, therefore, have difficulty finding young persons to hire. In addition, the younger population in *ejidos* and *comunidades agrarias* typically do not have sufficient resources to purchase land, and as such, inheritance is one of the only means for this group to acquire land. This situation has resulted in a low level of investment and innovation in social lands.

In 2003, the federal government responded by implementing a program through the Agrarian Reform Secretariat, which is intended to create access for young farmers and at the same time introduce a retirement system for older agrarian subjects. The Land Fund and Young Rural Entrepreneurs program was initiated as a pilot project in ten Mexican states, and in 2006 it was extended to the rest of the country. Agrarian subjects less than 40 years are recruited to run innovative projects on social land, and they receive training

regarding production techniques and business administration. Those who successfully complete the program are eligible for subsidized credit to purchase or rent social land within their *ejido* or *comunidad agraria* subject to Agrarian Law restrictions. Agrarian subjects older than 65 years who sell their land through the program have access to a subsidized pension fund as well as medical and life insurance. Hence, there is incentive for senior landholders to make an early transfer of their land to younger family members of the *ejido*.

Environmental cross-compliance/restrictions

Regulations and restrictions related to the protection of the environment are in place, including the following:

- Owners of land who plan to perform economic activities that might affect the environment or cause a change in the use of land must obtain authorization from the Secretaria de Medio Ambiente y Recursos Naturales. An impact analysis must detail actions required to minimize potential adverse effects on the environment.
- Owners of forest lands cannot substitute native vegetation with commercially-exploitable species unless it can be proven that such a change will not have a negative effect on biodiversity, or that the native vegetation is of little commercial or biodiversity-related value.
- Owners of forest land must obtain authorization from the Secretaria de Medio Ambiente y Recursos Naturales to change the use of land. Authorization is granted only if the owner can prove that the change will not endanger biodiversity or cause soil erosion, that the quality and quantity of available water will not be affected, and that the proposed use is more productive in the long term.
- Authorization can be denied by the Secretaria de Medio Ambiente for activities that may cause a species to become endangered or that may affect an endangered species.

Policies concerning the conversion of social property and environmental protection include the following: *Ejido* land that has been declared “protected natural area” cannot be urbanized. *Ejido* land that contains forests or tropical jungles cannot be allotted to individual agrarian subjects, and therefore cannot be converted into private property. If an agrarian subject converts his land to private property, any forests or tropical jungles must be surrendered to the federal government.

Part 2. Evaluation of significance of policies affecting land mobility and/or values

Policies that affect land mobility and asset values in Mexico were put in place in the early 20th century, most notably with the introduction of the 1917 Agrarian Law and the redistribution of land from large land owners to landless peasants. Expropriated land became social property, of which 83% is *ejidos* land –land distributed to peasants – and 17% is *comunidades agrarias* –land restored to indigenous groups. Social property accounts for 53% of Mexican territory, private property 37%, and federal lands 10%. Social property is classified as agrarian land and according to the original Agrarian Law, agrarian subjects could use the land but they could not own, sell, rent or sharecrop their

plots, nor could they hire labour. Reforms introduced by the 1992 Agrarian Law resulted in important changes for agrarian subjects, in particular improved land rights through recognition of occupancy rights, and better functioning land markets, especially rental markets. Nevertheless, social property still remains heavily regulated, and land mobility remains significantly restricted in these areas.

The social property of Mexico has been given special treatment with respect to a number of policies that influence land mobility and asset values in agriculture. Exceptions to this include policies related to farmer installation, social security and retirement pensions; however, changes are occurring in these areas with the implementation of the 2003 Land Fund and Young Rural Entrepreneurs program which is intended to create access for young farmers through subsidized credit to purchase or rent social land, and at the same time introduce a retirement system for older agrarian subjects. Policies specific to land ownership, purchasing and selling land, inheritance, and taxation offer the most special treatment. For instance, since agrarian subjects cannot formally own social land, they cannot use their plots as collateral for a loan and hence have great difficulty in accessing credit. In the case of inheritance laws, an heir must become an agrarian subject and cannot inherit rights over a parcel of land when it exceeds the 5% landholding limit within an *ejido*. Social property is also exempt from various taxes including property and inheritance taxes. In comparison, private property in agriculture or otherwise is generally given significantly less special treatment, particularly with respect to the purchase and sale of land and taxation. While many policies are apparently quite distinct for social property and private property, those related to the environment and agriculture-specific policies can apply to all Mexican farmers. For instance, policies such as the 1993 *Programa de Apoyos Directos al Campo* to support farmer incomes and the 1996 *Alianza para el Campo* to improve rural productivity, product quality and investment in capital goods are applicable to both social and private property regimes and have the potential to influence land mobility and asset values throughout Mexican agriculture.

Summary of

Review of Policies That Affect Land Mobility and/or Values

by
Finn G. Andersen

Part 1: Assessment of policies affecting land mobility and/or values

Inheritance laws

The Allodian Act of Norway is an inheritance law that has been in place for many years and applies only to agricultural and forestry property. The intention of the Allodian Act is to keep agricultural and forestry property in the possession of the same family. The allodia privilege gives one family the legally protected right to keep property within the family's possession. Descendants automatically inherit the allodial right. A person outside of the family who acquires the property will become a holder of the allodial right only once he has been the owner for 20 years. In order to be granted the allodial right, the person must live and operate a farm on the property. Under the Allodian Act, the minimum size of agricultural property is 2 hectares and for productive forestry property it is 10 hectares.

Other statutory provisions regarding inheritance include the Law of Inheritance and Succession, the Administration of Estates Act, and the Law of Adoption. The Law of Inheritance and Succession applies to both inheritance by means of a will and inheritance by succession. Under this law, persons who have the right to inherit once the owner is deceased are: (1) children and grandchildren (2) parents and their offspring and (3) grandparents and their offspring, but not beyond the deceased person's cousins. The spouse has his or her own right of inheritance. Apart from these family members, other relatives have no right to the family inheritance unless they are mentioned in a will. A person cannot disinherit his heirs.

Purchase and sale of land

The transfer of agricultural property in Norway is heavily regulated. The most important acts concerning land transfer are: (1) the Concession Act; (2) the Allodian Act (section 1 explains this act); and, (3) the Land Act. These Acts have a significant influence on the value and mobility of agricultural lands.

The Concession Act stipulates that with the acquisition of agricultural and forest properties of more than 10 hectares or agricultural and forest properties where more than

2 hectares are fully cultivated, exemption from the concession requirement is conditional on the acquirer taking up residence on the property within one year and for a minimum of five years. The acquirer must either operate the farm for at least five years, or rent the farmland as additional land to another farm enterprise for a minimum of ten years. The purpose of the Concession Act is to control the sale of land in order to achieve effective protection of agricultural areas. The conditions related to ownership and land use are to be beneficial to society and, among other things, should take into account the following: the needs of future generations; the agricultural industry; the need for development sites; the environment and general interests of nature conservation and outdoor recreation; and considerations related to settlements.

Certain land transfers do not require a concession under the Concession Act. These exceptions are:

- Transfers related to the character of the property, specifically: (1) Undeveloped land areas when they are located in an area that is regulated by a local development plan for a use other than agriculture, or that is designated as a development area by the land-use part of the municipal master plan. (2) Property that is built-on, does not exceed 10 hectares, and does not contain more than 2 hectares of fully cultivated area.
- Transfers related to the status of the purchaser, specifically: (1) The purchaser is the owner's spouse, a blood relative of the owner or of the owner's spouse in a direct line of ascent or descent, in the first collateral line of the owner or the owner's spouse including children of siblings, or related by marriage to the owner in a direct line of ascent. This is provided that the owner's concession is in order. (2) The purchaser has an allodial entitlement to the property.

Since concession is not necessary for the sale of a farm within the family, such sales are free. Most transfers of farms in Norway take place within a family. The rule under both the Concession Act and the Allodial Act that the acquirer must take up residence at the farm for at least five years is very much discussed in Norway. While this rule maintains settlement patterns in rural areas, it can prevent development in both rural and urban areas.

When a decision must be made whether an acquirer shall receive a concession, the Municipal Council takes the following factors into account: (1) Does the agreed price provide for a socially justifiable price development? (2) Does the acquirer's purpose take into account the interests of settlements in the area? (3) Does the acquisition involve an operationally satisfactory solution? (4) Is the acquirer regarded as qualified to work the property?

Where concession is necessary, the Ministry of Agriculture and Food provides the following guidelines for the valuation of agricultural property:

- Cultivated land and forest area: utility value.
- Out buildings and other constructions: replacement value (written-down).
- Farmhouses and other domestic buildings: replacement value (written-down) or annual letting value.
- Rights related to hunting, fishing, pasture, etc., and other resources: utility value or replacement value.

- The capitalization rate of interest is 4% (recently reduced from 7%) for agriculture and forestry lands.

The Concession Act and the Ministry's guidelines have a great impact on the transfer price of agricultural and forestry properties. However, there has been a rise in the price level of these properties in the past ten years, especially with respect to farm property and farm houses situated close to urban areas. The capitalization rate of interest plays a very important role in the price of farms sold in the open market.

The Land Act provides guidelines regarding other uses of agricultural and forestry lands, as well as rules against the division of land. The purpose of the Land Act is to provide conditions that ensure the land and resources of Norway may be used in a manner that is most beneficial to society and to those working in the agricultural sector. Certain areas are exempt from the Land Act, including areas under the Planning and Building Act that are allocated to purposes other than agriculture. According to the Act, agriculture and forestry property cannot be divided without the consent of the Ministry of Agriculture and Food. The prohibition against the division of property applies to, for instance: land under tenancy; land subject to long-term leases that entitle the lessee to build a house on the property; and land subject to right of use of part of the property when the right has been established for a period more than ten years or cannot be revoked by the owner/lesser. Prohibitions against division also include rental cabins, ski slopes, downhill slopes, camping sites, etc., when these activities are in connection with a farm enterprise.

Most farms in Norway are farmer owned, and the average size of a Norwegian farm is less than that of a Western European farm. More and more, Norwegian farmers are entering into cooperative enterprises. Cooperatives are most common in milk production given the system of milk quota. The Concession Act and the Allodial Act prevent farmers from establishing a company or entering a partnership that owns the land. However, farmers can establish companies or enter partnerships that operate the land. Farmers are increasingly starting other businesses on the farm, for instance enterprises related to tourism, small-scale food production, and contractor operations. It is often difficult, though, for farmers to divide their farms into different enterprises, and therefore it will become increasingly difficult to have such strict rules pertaining to agriculture.

Taxation: property, inheritance, income and capital gains

A stamp duty is paid on the transfer of land. In 2006, the stamp duty was 2.5%, with a lower limit of NOK 250. The property value is based on the real market value; however in the case of agricultural properties, the value cannot be greater than the licensing authority will accept. Application of the stamp duty is independent of the relationship between the seller and buyer, except in the case of transfers of title for intestate succession. An intestate successor does not pay a stamp duty for his share of inheritance of the property. When freehold land (allodium) is transferred to a person with the allodial right of inheritance, the basis for the stamp duty is the marked price reduced by 25%.

In the case of inheritance taxes, in general, the first 250 000 Norwegian crowns are exempt from taxation, the next NOK 300 are taxed at 8% for children and parents and 10% for other heirs, and the amount exceeding NOK 550 000 is taxed at 20% for children and parents and 30% for other heirs. The inheritance of the spouse of a deceased person, however, is exempt from taxation. Most farm transfers in Norway occur within families. A retiring farmer will often receive a pension from the new farmer, as part of the payment for the farm. In this situation, the basis of the inheritance tax must be reduced by the

capitalized value of the pension contract. The capitalization factor depends on the age of the retiring farmer and the spouse. As of 2006, an instalment system for inheritance taxes was implemented to alleviate the burden of inheritance taxes for younger generations of family farm businesses. Instalments will be interest free and the tax will be calculated at a reduced present value.

From 2006, in general, the capital gains tax increased from 28% to between 35.8% and 51.3% depending on the surtax level. For agriculture, prior to 2004, capital gains on all assets were tax-free if the seller had owned the farm for ten years or more. As of 2004, this tax exemption has applied only to sales within a family, whereby the family is limited to persons who are entitled to inherit according to the Inheritance Act.

Agriculture and forestry lands are exempt from property taxes. However, as of 2005, it is not possible to deduct maintenance costs, insurance premiums, etc. associated with farmhouses. Maintenance costs, etc for farmhouses and farm buildings that are rented out –for instance farmhouses rented to retired farm families– are still tax deductible. Income from rented farmhouses still is taxable.

With the income tax reform of 1992 to reduce tax-induced distortions by lowering the tax rates and broadening the tax base, there is now a two-tier structure: general income, as capital income, is taxed at a flat tax rate of 28%, and personal income from employment and pensions is taxed progressively. The subsequent reform of 2006 is intended to reduce the difference between the maximum marginal tax rate for capital income and labour income. With the 2006 reform, the split-income model for taxation of income from self-employment is replaced by various other models. Of the three types of enterprises relevant for self-employment (companies, partnerships, and sole proprietorship), the vast majority of farm enterprises are sole proprietorships which are to be taxed according to the “source-based model” which distinguishes between ordinary and personal income. The “shareholder model” is to be the basis for taxation of companies and partnerships. An important difference between the source-based model and the other two self-employment models is that profits are taxed in the year they are generated even when they are kept within the business. Concession and land tenure regulations limit the inclusion of real estate in agriculture in the formation of business enterprises. Nevertheless, it is becoming more common to form businesses for the organization of farm organizations, especially in the dairy sector. The new taxation models may contribute to an acceleration of business enterprise establishment in agriculture.

Social Security: retirement pensions

The social insurance scheme of Norway is financed by contributions from employees, self-employed persons, employers’ contributions, and contributions from the state. Contributions from employees and self-employed persons are calculated on the basis of personal gross income: employees contribute 7.8% of personal income, self-employed persons in agriculture, forestry and fisheries contribute 7.8% of personal income, and all other self-employed persons contribute 10.7% of personal income. The contribution from employers is assessed as a percentage of paid wages; the main rate is 14.1%, however the rate is lower in rural and other parts of the country.

The old age pension is an important aspect of the social insurance scheme. The general retirement age is 67 years. All persons of Norway can claim old-age pension, even if they have not contributed to the social insurance scheme. In 2006, Norway started to implement pension reforms and the details are still being determined. The pension

system has been under pressure for many reasons. The number of older persons has been on the increase, and these persons are living longer. At the same time, fewer children are being born. Pension expenditures within the National Insurance Scheme have increased greatly, while government revenues have not been increasing sufficiently to offset the higher pension expenditures. The reform will involve self-employed persons, who can pay 2% of their income to a fund.

The government and farmers' unions meet annually to negotiate agricultural policy. In 1998, the agricultural negotiations resulted in a decision concerning a new pension scheme for farmers who wish to retire prior to the general age associated with old-age pension of the national insurance. The goal of the decision was to accelerate the involvement of the younger generation in the agriculture industry. Under the new scheme, farmer pension income can commence at the age of 62 instead of 67 years, given the fulfilment of the following conditions: the person must be between 62 and 67 years; the farm must be transferred to the new owner; the farmer must have been farming for not less than 15 years; the income from agriculture/horticulture and forestry must have been not less than 90,000 Norwegian crowns in 2006; not less than 25% of the combined annual income from agriculture/horticulture and forestry must be from agriculture/horticulture; and not less than 67% of total annual income must be from agriculture/horticulture.

Furthermore, with the new scheme, the spouse/cohabitant of the farmer can receive half of the pension if the following conditions are fulfilled: spouse/cohabitant must be more than 61 years; spouse/cohabitant must have lived and worked on the farm for the past five years; the income from farming of the farmer and the spouse/cohabitant must not be less than 50% of their total income; and the spouse/cohabitant cannot have an income more than NOK 80 000 from other sources during a specified period.

Other conditions related to receiving the special pension under this scheme are:

- A farmer cannot own any agriculture or forestry property or earn self-employment income from agriculture/horticulture or forestry; however, he may earn up to NOK 150 000 in wage income or income from other business sectors. Should his income exceed this amount, the pension income will be reduced.
- If the pension is split between the farmer and spouse/cohabitant, the spouse/cohabitant can also earn up to NOK 150 000 in wage income or income from the business sectors.
- If a spouse/cohabitant also receives the pension, the total combined pension for the farmer and spouse/cohabitant will be NOK 144 000.

Part 2. Evaluation of significance of policies affecting land mobility and/or values

Policies that significantly affect land mobility and asset values in Norwegian agriculture have been in place for a long time. The Allodian Act has had a very great influence on the transfer and inheritance of agricultural and forestry property for many years, giving a family the right to maintain land within its possession from generation to generation. An acquirer outside of a family can obtain the allodial right only once he has been the owner and lived on and operated the farm for 20 years. The transfer of agricultural land in Norway is also heavily regulated by the Concession Act and Land Act. The Concession Act stipulates that exemption from the concession requirement is conditional on the acquirer residing on the property and operating on the farmland

himself for a minimum of five years. The Land Act provides rules against the division of land.

The Norwegian agriculture sector has been given special treatment under a number of policies that influence land mobility and asset values. Policies specific to agricultural land ownership, inheritance, transfer and use likely offer the greatest level of special treatment; and policies related to social security and pensions, and taxation also provide special treatment. Most farms in Norway are farmer owned, and most transfers of farms occur within a family. The average size of a Norwegian farm is less than that of a Western European farm. There is much discussion in Norway concerning the impact the Allodian Act and Concession Act, in particular, have on the development of both rural and urban areas.

Bibliography

- Alston, J.M. (1986), “An analysis of growth of US farmland prices, 1963-82”, *American Journal of Agricultural Economics*, 68(1): 1-9.
- Arnott, R.J., Lewis, F.D. (1979), “The transition of land to urban use”, *Journal of Political Economy*, 87: 161-170.
- Baker, T.G., Ketchabaw, E.H., Turvey, C.G. (1991), “An income capitalization model for land value with provisions for ordinary income and long-term capital gains taxation”, *Canadian Journal of Agricultural Economics*, 39(1): 69-82.
- Barnard, C.H., Whittaker, G., Westenbarger, D., Ahearn, M. (1997), “Evidence of capitalization of direct government payments into U.S. cropland values”, *American Journal of Agricultural Economics*, 79(5): 1642-1650.
- Barthélémy, D. (1997), *Evaluer l'entreprise agricole*, Presses Universitaire de France, Collection Gestion, Paris. 229p.
- Bierlen, R., Parsch, L., Dixon, B., Ahrendsen, B. (2000), “The 1996 FAIR Act: Measuring the impacts on land leasing”, *Review of Agricultural Economics*, 22(2): 336-354.
- Burt, O.R. (1986), “Econometric modeling of the capitalization formula for farmland prices. *American Journal of Agricultural Economics*, 68(1): 10-26.
- Campbell, J.Y., Shiller, R.J. (1987), “Cointegration and tests of present value models”, *Journal of Political Economy*, 95(4): 1062-1088.
- Cavailhès, J., Degoud, S. (1995), “L'évaluation du prix des terres en France: Une application de la réforme de la PAC”, *Cahiers d'Economie et de Sociologie Rurales*, 36: 49-77.
- Cavaillès, J., Wavreski, P. (2003), “Urban influences on periurban farmland prices”, *European Review of Agricultural Economics*, 30(3): 333-357.
- Chavas, J.P., Jones, B. (1993), “An analysis of land prices under risk”, *Review of Agricultural Economics*, 15: 351-366.
- Clark, J.S., Fulton, M., Scott, J.T.Jr. (1993), “The inconsistency of land values, land rents, and capitalization formulas”, *American Journal of Agricultural Economics*, 75: 147-155.
- Clark, J.S., Klein, K.K., Thompson, S.J. (1993), “Are subsidies capitalized into land values? Some time series evidence from Saskatchewan”, *Canadian Journal of Agricultural Economics*, 41: 155-168.
- Courleux, F. (2006), *Que changent vraiment le découplage et les droits à produire ?* Speech at SPACE (Salon des Productions Animales), Rennes, 12 September 2006.
- Cowling, K., Metcalf, D., Rayner, A.J. (1970), *Resource structure of agriculture: An economic analysis*. Pergamon Press, Oxford.
- Dewbre, J., Anton, J., Thompson, W. (2001), “The transfer efficiency and trade effects of direct payments”, *American Journal of Agricultural Economics*, 83(5): 1204-1214.
- Dewbre, J. and Short, C. (2002), “Alternative policy instruments for agriculture support : Consequences for trade, farm income and competitiveness”, *Canadian Journal of Agricultural Economics*, 50(4): 443-464.
- Duvivier, R., Gaspart, F., Henry de Frahan, B. (2005), *A Panel Data analysis of the Determinants of Farmland Price: An Application to the Effects of the 1992 CAP Reform in Belgium*. Paper presented at

- the XIth European Association of Agricultural Economists Congress , Copenhagen, Denmark, 23-27 August.
- Engsted, T. (1998), Do farmland prices reflect rationally expected future rents? *Applied Economics Letters*, 5: 75-79.
- ERS USDA. (2001a), *Government Payments to Farmers Contribute to Rising Land Values*, Agricultural Outlook June-July 2001. Economic Research Service, United States Department of Agriculture, Washington DC.
- ERS USDA. (2001b), *Higher Cropland Value from Farm Program Payments: Who Gains?* Agricultural Outlook November 2001. Economic Research Service, United States Department of Agriculture, Washington DC.
- Falk, B. (1991), Formally testing the present value model of farmland prices, *American Journal of Agricultural Economics*, 73(1): 1-10.
- Falk, B. (1992), Predictable excess returns in real estate markets: A study of Iowa farmland values, *Journal of Housing Economics*, 2: 84-105.
- Falk, B., Lee, B.S. 1998. Fads versus fundamentals in farmland prices. *American Journal of Agricultural Economics*, 80: 696-707.
- Featherstone, A.M., Baker, T.G. (1988), Effects of reduced price and income supports on farmland rent and value. *North Central Journal of Agricultural Economics*, 10(1): 177-90.
- Feldstein, M. (1980), Inflation, portfolio choice and the prices of land and corporate stocks. *American Journal of Agricultural Economics*, 62(4): 532-546.
- Flanders, A., White, F.C., Escalante, C.L. (2004), *Comparing Land Values and Capitalization of Cash Rents for Cropland and Pasture in Georgia*. Paper presented at the Southern Agricultural Economics Association Annual Meeting, Tulsa, Oklahoma, 14-18 February.
- Floyd, J.E. (1965), "The effects of farm price supports on the returns to land and labor in agriculture", *Journal of Political Economy*, 73: 148-158.
- Gardner, B.L. (1987), *The Economics of Agricultural Policies*, New-York, Macmillan.
- Gisser, M. (1993), "Price support, acreage controls, and efficient redistribution", *Journal of Political Economy*, 101(4): 584-609.
- Goodwin, B.K., Ortalo-Magné, F. (1992), The capitalization of wheat subsidies into agricultural land values. *Canadian Journal of Agricultural Economics*, 40(1): 37-54.
- Goodwin, B.K., Mishra, A.K., Ortalo-Magné, F. 2003. What's wrong with our models of agricultural land values? *American Journal of Agricultural Economics*, 85(3): 744-752.
- Goodwin, B.K., Mishra, A.K., Ortalo-Magné, F. (2005), *Landowners' Riches: The Distribution of Agricultural Subsidies*. University of Wisconsin-Madison School of Business, Department of Real Estate and Urban Land Economics, April 2005, unpublished. Cited with permission.
- Guyomard, H., Le Mouél, C., Gohin, A. (2004), Impacts of alternative agricultural income support schemes on multiple policy goals. *European Review of Agricultural Economics*, 31(2): 125-148.
- Hallam, D., Machado, F., Rapsomanikis, G. (1992), Co-integration analysis and the determinants of land prices. *Journal of Agricultural Economics*, 43(1): 28-37.
- Hanson, S.D., Myers, R.J. (1995), Testing for a time-varying risk premium in the returns into farmland. *Journal of Empirical Finance*, 2(1): 265-276.
- Harvey, D.R. (1974), *A theoretical and empirical analysis of agricultural land values in England and Wales*. M.A. Dissertation, University of Manchester.
- Herd, R.W., Cochrane, W.W. (1966), Farm land prices and technological advance. *Journal of Farm Economics*, 48(2): 243-263.

- Hertel, T. W. (1989), Negotiating reductions in agricultural support: Implications of technology and factor mobility. *American Journal of Agricultural Economics*, 71(3): 559-573.
- Hertel, T.W. (1991), Factor market incidence of agricultural trade liberalization: Some additional results. *Australian Journal of Agricultural Economics*, 35(1): 91-107.
- Just, R.E., Miranowski, J.A. (1993), Understanding farmland price changes. *American Journal of Agricultural Economics*, 75(1): 156-68.
- Lamb, R.L., Henderson, J. (2000), FAIR Act implications for land values in the Corn Belt. *Review of Agricultural Economics*, 22(1): 102-119.
- Latruffe, L., Le Mouél, C. (2006), *Description of agricultural land market functioning in partner countries*. IDEMA working paper, deliverable 09.
- Leathers, H.D. (1992), The market for land and the impact of farm programs on farm numbers. *American Journal of Agricultural Economics*, 74(2): 291-298.
- Lence, S., Mishra, A. (2003), The impacts of farm programs on cash rents. *American Journal of Agricultural Economics*, 85(3): 753-761.
- Lloyd, T.A., Rayner, A.J., Orme, C.D. (1991), Present value model of land prices in England and Wales. *European Review of Agricultural Economics*, 18: 141-166.
- Maddison, D. (2000) A hedonic analysis of agricultural land prices in England and Wales. *European Review of Agricultural Economics*, 27(4): 519-532.
- Melichar, E. (1979), Capital gains versus current income in the farming sector. *American Journal of Agricultural Economics*, 61(4): 1085-1092.
- OECD, (1996), *Policies affecting farmland mobility*. OECD/GD(1996)125, Paris.
- OECD (1998), *Adjustment in OECD Agriculture: Reforming Farmland Policies*, Paris
- OECD (2001), *Market Effects of Crop Support Measures*, Paris
- OECD (2002a), *The incidence and income transfer efficiency of farm support measures*, AGR/CA/APM(2001)24/Final, Paris.
- OECD (2002b), *Effects of quantitative constraints on the degree of decoupling of crop support measures*. AGR/CA/APM(2002)12/FINAL, Paris.
- OECD (2004), *Non-sectoral Policies for the Agriculture and Agro-Food Sectors: Taxation and Social Security*. AGR/CA/APM(2004)13/FINAL, Paris.
- OECD (2005a), *Dairy Policy Reform and Trade Liberalisation*, Paris
- OECD (2005c), *Adjustment Options And Strategies In The Context Of Agricultural Policy Reform And Trade Liberalisation*, AGR/CA/APM(2005)18/FINAL
- OECD (2005d), *Decoupling: Policy Implications*. AGR/CA/APM(2005)22/FINAL
- OECD (2006a), *Agricultural Policies in OECD Countries, Monitoring and Evaluation*, Paris
- Offut, S., Shoemaker, R. (1990), Agricultural land, technology and farm policy. *Journal of Agricultural Economics*, 41(1): 1-8.
- Oltmer, K., Florax, R.J.G.M. (2001), *Impacts of Agricultural Policy Reform on Land Prices: A Quantitative Analysis of the Literature*. Paper presented at the Annual Meeting of the American Agricultural Economics Association and the Canadian Agricultural Economics Society, Chicago, 5-8 August.
- Palmquist, R.B. (1989), Land as a differentiated factor of production: A hedonic model and its implications for welfare measurement. *Land Economics*, 65(1): 23-28.

- Plantiga, A.J., Miller, D.J. (2001), "Agricultural land values and the value of rights to future land development", *Land Economics*, 77(1): 56-67.
- Plantiga, A.J., Lubozski, R.N., Stavins, R.N. (2002), "The effects of potential land development on agricultural land prices", *Journal of Urban Economics*, 52: 561-581.
- Reynolds, J.E., Timmons, J.F. (1969), "Factors affecting farmland values in the United States," *Iowa Agricultural Experiment Station Research Bulletin*, 566.
- Roberts, M.J., Barrett, K., Hopkins, J. (2003), "The incidence of government program payments on agricultural land rents: The challenges of identification", *American Journal of Agricultural Economics*, 85(3): 762-769.
- Robison, L.J., Lins, D.A., VenKataraman, R. (1985), "Cash rents and land values in U.S. agriculture", *American Journal of Agricultural Economics*, 65(4): 794-805.
- Roche, M.J., McQuinn, K. (2001), "Testing for speculation in agricultural land in Ireland", *European Review of Agricultural Economics*, 28(2): 95-115.
- Rutherford, T.F., Whalley, J., Wigle, R.M. (1990), "Capitalization, conditionality, and dilution: Land prices and the U.S. wheat program", *Journal of Policy Modeling*, 12(3): 605-622.
- Schmitz, A. (1995), "Boom/bust cycles and Ricardian rent", *American Journal of Agricultural Economics*, 77(5): 1110-1125.
- Shaik, S., Helmers, G.A., Atwood, J.A. (2005), "The evolution of farm programs and their contribution to agricultural land values", *American Journal of Agricultural Economics*, 87(5): 1190-1197.
- Shaik, S., Atwood, J.A., Helmers, G.A. (2006), *Farm Programs and Agricultural Land Values: The Case of Southern Agriculture*, Paper presented at the Southern Agricultural Economics Association Annual Meeting, Florida, 5-8 February.
- Shalit, H., Schmitz, A. (1982), "Farmland accumulation and prices", *American Journal of Agricultural Economics*, 64(4): 710-719.
- Shigeto, S., Hubbard, L. (2004), *The Farmland Market in Japan: A Present Valuation Model*, Paper presented at the 78th Annual Conference of the Agricultural Economics Society, Imperial College London, 2-4 April.
- Shiha, A.N., Chavas, J.P. (1995), "Capital segmentation and US farm real estate pricing", *American Journal of Agricultural Economics*, 77: 397-407.
- Swinbank, A. and S. Tangermann (2001), "The future of direct payments under the CAP: A proposal", *Eurochoices*, Spring 2001: 28-29 and 32-34.
- Tangermann, S. (1991), "A bond scheme for supporting farm incomes", in Marsh J., Green B., Kearney B., Mahé L., Tangermann S., Tarditi S., *The changing role of the Common Agricultural Policy: The future of farming in Europe*. London: Belhaven Press.
- Taylor, M.R, Brester, G.W. (2005), "Noncash income transfers and agricultural land values", *Review of Agricultural Economics*, 27(4): 526-541.
- Tegene, A., Kuchler, F. (1993), "A regression test of the present value model of US farmland prices", *Journal of Agricultural Economics*, 44(1): 135-143.
- Traill, B. (1979), "An empirical model of the UK land market and the impact of price policy on land values and rents", *European Review of Agricultural Economics*, 6: 209-232.
- Traill, B. (1982), "The effect of price support policies on agricultural investment, employment, farm incomes and land values in the U.K.", *Journal of Agricultural Economics*, 33(3): 369-385.
- Tsoodle, L.J., Golden, B.B., Featherstone, A.M. (2006), "Factors influencing Kansas agricultural farm land values", *Land Economics*, 82(1): 124-139.

- Tweeten, L.G., Martin, J.E. (1966), “A methodology for predicting United States farm real estate price variation”, *Journal of Farm Economics*, 48(2): 378-393.
- USDA (2003), *Decoupled payments: Household income transfers in contemporary US*. ERS, USDA, report n° 822.
- Vantreese, V.L., Reed, M.R., Skees, J.R. (1989), Mandatory production controls and asset values: A case study of burley tobacco quotas. *American Journal of Agricultural Economics*, 71(2): 319-325.
- Veeman, M.M., Dong, X.Y., Veeman, T.S. (1993), “Price behaviour of Canadian farmland”, *Canadian Journal of Agricultural Economics*, 41(2): 197-208.
- Weersink, A., Clark, S., Turvey, C.G., Sarker, R. (1999), “The effect of agricultural policy on farmland values”, *Land Economics*, 75(3): 425-439.
- Whitaker, J.B. (2006) *The Effects of Decoupled Government Subsidies on Farm Household Well-Being*, Department of Economics, Utah State University.
- Wichern, R. (2004) “Economics of the Common Agricultural Policy” *European Economy*, No. 211, Brussels.
- World Bank (2004) *Tax Expenditures – Shedding Light on Government Spending through the Tax System: Lessons from developed and transition economies*. Editors: H.P. Bixi, C.M.A. Valenduc, and Z.L. Swift, Washington

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Agricultural Support, Farm Land Values and Sectoral Adjustment

THE IMPLICATIONS FOR POLICY REFORM

Governments intervene in the agricultural sector through policies that both support and shape agricultural production. This leads to two important outcomes. First, agriculture specific programmes intended to increase the welfare of farmers – whether through commodity prices, input subsidies, or direct cash transfers – can become capitalised into asset values. These higher asset values translate to increased wealth for current sector participants, but the resulting higher cost structure can have deleterious effects. Second, many policies, in particular regulatory ones, reduce asset mobility – the ease with which capital, land, labour and other inputs are transferred between different economic activities. This results in reduced economic efficiency due a sub-optimal allocation of resources, and can potentially further exacerbate the capitalisation phenomena.

This study focuses on the capitalisation of government support into land rents and prices. It assesses the consequences of inflated asset values, and suggests lessons for future policy making.

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