

## Decoupling Agricultural Support from Production

**How do support policies affect production?**

**Do market effects vary between support policies?**

**What about conditions and constraints?**

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### Introduction

A traditional objective of agricultural support policy was to increase production or maintain it at a certain level. Consequently, almost all policies were closely linked to production. Tariffs, export subsidies and other methods were used to support market prices, farmers were given direct payments for boosting production and governments subsidised items such as fertilisers.

Since the mid-1980s there has been a move away from these policies towards providing support on the basis of area, farm income or even per farm. This change has occurred because the production objective has been reached or is no longer valid, other objectives have become more important, and international commitments have required a change. The extent of this reform varies considerably between OECD members and the overall level of support remains high in many countries.

Many of the initiatives have been inspired by the concept of decoupling. Decoupling agricultural support means reforming policies to reduce their interference with production decisions. But how do the different types of agricultural support affect production?

The OECD has been working since 1999 to answer this question and to identify the characteristics that contribute to a more decoupled support policy. Many different methods and tools have been used in the attempt to improve understanding as this aspect of agricultural policy has become increasingly important. Analysis focuses on the arable crop sector, where a significant change in the composition of support has occurred, and where the move to area payments, the basis on which most of the newer forms of support are paid to farmers, has been most pronounced.

This Policy Brief synthesises the results of this major undertaking. Insights have been gained into the general magnitude and nature of the impacts. The production, trade and farm income effects of decoupling have been considered in detail, with relatively less attention given to the possible environmental and overall welfare impacts of reform. ■

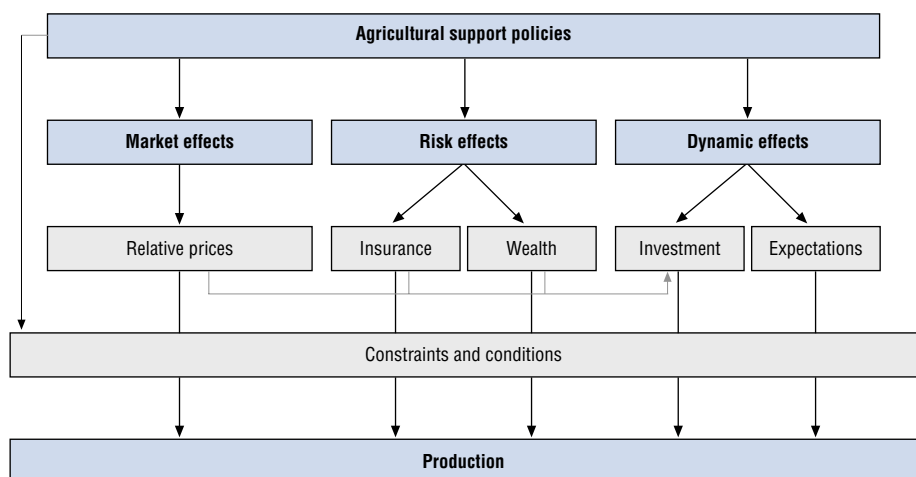
**How do support policies affect production?**

Support policies affect production through a number of channels (Figure 1). *Market effects* occur when support policies change the incentive prices of agricultural outputs or inputs – the price to which the farmer responds. *Risk effects* occur in an uncertain world when farmers are risk-averse and support policies either reduce revenue variability and/or raise income. *Dynamic effects* occur when a time dimension is added and include investment decisions and farmers’ expectations concerning future government behaviour. These effects can occur simultaneously, are cumulative and can be influenced by eligibility conditions or quantitative constraints attached to the receipt of support.

The analysis reported here relies on an empirical notion referred to as the “Degree of Decoupling”, which compares the production impact of a given change in support policy to the production impact of a similar change in market price support (MPS). MPS is chosen as the reference because it is considered to be a fully coupled measure. So, if the Degree of Decoupling of a policy instrument is estimated to be less than one, it means that it has a smaller effect on production than market price support. The legal concept of decoupling that is embodied in the World Trade Organization (WTO) agreement on agriculture is not examined. Also, because the Degree of Decoupling measure relates to production (or trade) impacts, there is no analysis of how agricultural policy measures affect the environment, either for better or worse (positive or negative externalities), or how they affect public goods such as biodiversity that may be associated with agricultural production and there has not been any analysis of the overall welfare implications of policies that reduce risk.

Because the economic cost of support grows more than proportionately with the level of support provided (diminishing marginal impact of support), the ratio (degree of decoupling) depends on the initial levels of support from which the changes are made. The ratio will be higher the greater the initial rate of market price support and the lower the initial rate of support provided by the policy under comparison. ■

**Figure 1.**  
CHANNELS THROUGH WHICH SUPPORT POLICIES IMPACT PRODUCTION



**Do market effects vary between support policies?**

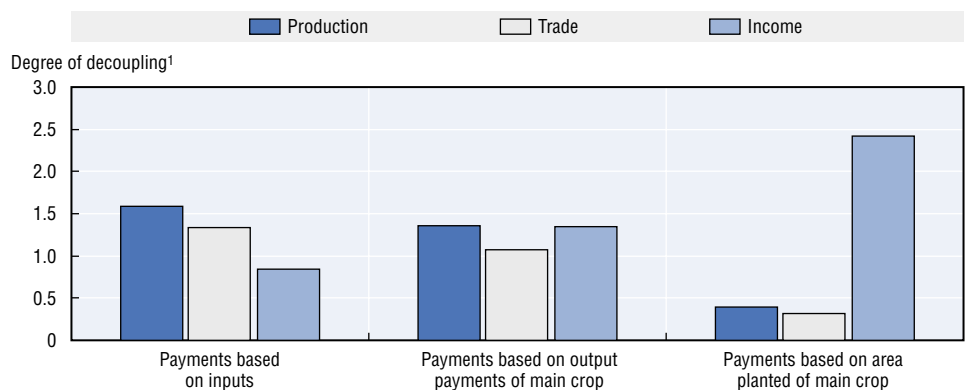
As a first step in analysing the production impact of support policies, the OECD developed a Policy Evaluation Model (PEM) to study the market effects on supply and demand for four arable crops (wheat, coarse grains, oilseeds and rice) in six countries (Canada, the European Union [EU], Japan, Mexico, Switzerland and the United States [US]) and the “rest of world”. Using the PEM, the OECD simulated the market effects of small, equal changes in several “stylised” support policies on a number of variables including production, trade and farm income.

The model shows that production impacts differ substantially among policies depending on how the support is provided to farmers. Payments based on area were found to be significantly less production- and trade-distorting than either those based on output (market price support and payments based on output) or payments based on input use (Figure 2). Area payments were also more efficient in transferring income to farmers, specifically landowners. These findings are supported by econometric analysis of actual support policies. For example, a study of Italian crop farmers showed a smaller increase in output in response to area payments than to price support measures.

However, more empirical work is required, particularly regarding the underlying cause of change. A major theoretical explanation for the smaller production impact of area payments is that they are paid on the basis of a factor of production (land) whose supply is generally quite inelastic, creating an incentive for a more extensive use of land, resulting in lower crop yields. Empirical analysis of national yield changes for selected crops among EU member states since the early 1990s is not strong enough to confirm a reduction in yields in response to a shift from price support to area payments.

These estimates of the degree of decoupling provide an indication of the marginal impact of a support measure, but what about the total impact? It has been shown that a small *marginal* production impact does not necessarily imply a small *total* production impact because the relationship

**Figure 2.**  
**MARKET RELATED IMPACTS OF SUPPORT POLICIES**



1. Measures the impact of the support policy on production and trade relative to the impact of market price support. The smaller the value, the larger the degree of decoupling.

Source: *Market Effects of Crop Support Measures*, OECD, 2001.

between support and production may not be linear. Additionally, even highly decoupled support programmes may have a significant total impact on production if they provide a high overall level of support. ■

### What about conditions and constraints?

In some cases payments are subject to eligibility conditions, determining what can be produced and/or how it is produced. In other cases support policies include constraints on the volume of production or the area used. What influence do these have on the level of decoupling?

In terms of eligibility conditions, the study found that support policy had less impact on production decisions the broader the product coverage of the policy (i.e. the larger the freedom given to farmers to produce what they want or even to not produce) and the smaller the restrictions on farm practices. The initial PEM study indicates substantial differences in the production impact of area payments depending on what can be produced in order to receive the support. An area payment to just the main crop had a larger production impact than an area payment covering all four crops, with the least production impact arising when the area payment allows any agricultural output to occur on the land.

This finding regarding the breadth of eligibility conditions has also been illustrated using data from farm surveys. Even the absence of an obligation to produce, while reducing the aggregate production response, is not a sufficient condition for a payment to be fully decoupled. Finally, eligibility conditions requiring minimum maintenance or cross compliance activities (for example when a farmer is required to meet some environmental requirements on the land in order to be eligible for the payment) may create incentives to change production patterns and not just techniques.

Analysis using the PEM found that a quantitative constraint will reduce the production impacts of a support policy only if it is binding at the farm level. The EU area payment scheme introduced in 1992 included two constraints: a maximum base area entitled to receive the payment at the EU member state level, and a compulsory set-aside area at the farm level. Simulations of market effects under these constraints show that the aggregate base area provision had very little impact on the degree of decoupling whereas the set-aside provision increases the degree of decoupling considerably. However, production constraints can also make domestic markets less responsive to prices and other changes, potentially increasing adjustment pressure on other countries and the variability of world prices. For this reason production constraints cannot be considered as decoupled. ■

### How significant are risk-related effects?

The analysis of market effects assumed there was no risk or uncertainty affecting farmers' decisions. But of course in the real world, farmers face some degree of uncertainty. If farmers are risk averse, then as uncertainty decreases, production will increase (the "insurance effect"); and if they become less risk averse as their income rises, a higher income will see them take more production risks (the "wealth effect"). Risk-related effects therefore require two conditions. First, farmers must be risk averse and prefer a sure

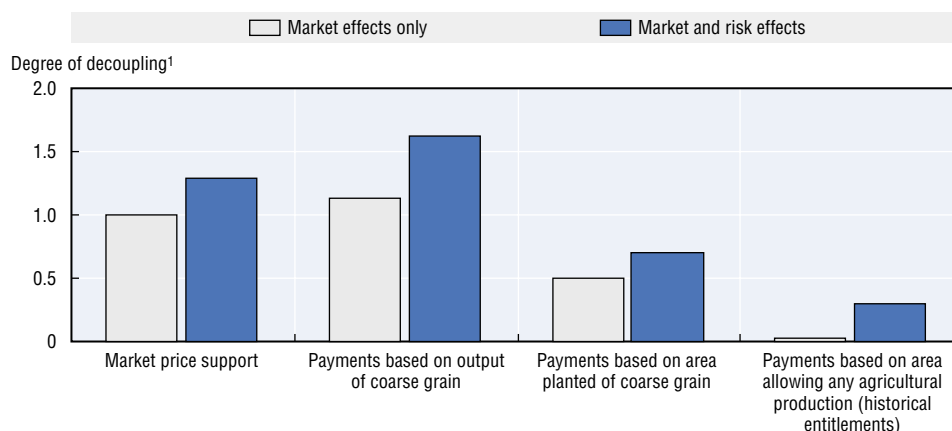
income to an uncertain one with the same expected value. Second, support policies must either affect the degree of uncertainty or raise farm incomes, or both.

Econometric results confirm the findings of previous studies that farmers as a group are risk averse. Statistical analysis of support policies in all OECD countries shows that all forms of support both increase revenue and reduce the variability of receipts, although MPS is the main risk reducing type of support. Risk effects should be analysed to obtain a more accurate estimate of the production impact of support measures.

When the estimated risk aversion parameters are incorporated into the PEM, the likely production impact of all the stylised support policies increases. The risk related effects are significant and in some cases are estimated to be larger than the market effects. Insurance effects tend to be much larger than wealth effects but this may reflect the dominance of support policies that reduce price variability over those that efficiently transfer income to farmers. Figure 3 illustrates the results for US coarse grain.

While confirming the original hierarchy of policies based on how support is provided to farmers, the risk effect analysis highlights the potential production impact due to how the rate of payment is determined. In particular, support policies that contain a counter-cyclical component tend to exhibit large insurance effects and consequently have a bigger production impact than similar policy instruments without a counter-cyclical component. These policies increase support when market prices are low and vice versa. Market price support measures generally exhibit this characteristic but other forms of support can include such components. For example, ad hoc Market Loss Assistance (MLA) payments in the US while paid per historical hectare (area planted to particular crops in the past) have an explicit counter-cyclical dimension. The production impact of this measure

**Figure 3.**  
RISK-RELATED  
PRODUCTION IMPACTS  
OF SUPPORT MEASURES  
FOR US COARSE GRAIN



1. Measures the impact of the support policy on production and trade relative to the impact of MPS. The smaller the value, the larger the degree of decoupling.

Source: Paper 417 in “Special Issue on Decoupling Agricultural Support”, OECD Papers, Vol. 5, No. 11, 2006; *Market Effects of Crop Support Measures*, OECD, 2001.

is estimated to be ten times larger when risk related effects are included. In contrast, Agricultural Market Transition Assistance (AMTA) payments, a fixed payment per historical tonne (quantities produced in the past), is estimated to have significantly smaller effects. ■

### What are the implications of dynamic effects?

Both current and future production levels are also affected by the level of farm investment, which can be difficult to adjust in the short term. Support policies can be expected to increase investment through their effect on incentive prices, increasing the return on capital from agriculture compared to alternatives (“dynamic” price effects). Farm investment may require resources that go beyond current revenue (creating dependence on expected future returns and availability of funds) and is to a certain extent irreversible (giving value to any information that can be obtained in order to take an investment decision). Consequently, support policies can also impact on investment levels by relaxing information and capital constraints (“dynamic” wealth effects), or by reducing uncertainty (“dynamic” insurance effect).

Two econometric studies found that support policies that alter relative prices appear to have the strongest impact on investment decisions. For example, a study of Italian crop farmers estimated a 14% decrease in investment, driven primarily by an increase in the variability of returns due to a fall in market price support (insurance effect). In Manitoba, the Gross Revenue Insurance Program (GRIP) which linked payments to crop prices increased annual investment in the cereal sector by 22%, driven by both price and insurance effects. Alternatively, the Net Income Stabilization Account (NISA) programme which followed it and which was commodity neutral, increased annual investment by 12%, with wealth and insurance effects equally important. Only the Italian study considered the investment effects on production and found these to be smaller than the market or risk related effects.

Support policies can also effect production decisions if they create expectations regarding some dynamic linkage between current production and the entitlement to, or the amount of, support in the future. This linkage is determined by conditions and rules attached to current payments and by expected conditions and rules attached to future payments. This expectation is more likely to exist when there is some historical base for entitlement or for the amount of payment, and when this base could potentially be updated.

At this point in time there is no single agreed framework explaining how these expectations are created, nor about the underlying decision process concerning future policies. But the experiments carried out for this study suggest that if the expectation of updating base area and yields has been created and is confirmed, this will generate the strongest production responses. If, however, the update is uncertain and only voluntary, the effect on production can be significantly reduced. ■

### What can be done to improve decoupling?

From a theoretical point of view it is difficult to contend that any support policy can be fully decoupled in the sense of having no effect on production – decoupling should be viewed as a matter of degree rather than as an absolute.

This is born out by empirical analysis which has found that all the types of support measures studied have statistically significant effects on production at the margin. Production impacts increase as the analysis expands from purely market effects to include risk and dynamic effects. While work should be done to strengthen the conclusions derived to date and to assess the degree of decoupling for specific support measures, several characteristics of what constitutes a more decoupled policy have already emerged (Box).

While some recent changes are pushing decoupling forward, *e.g.* the EU Single Payment Scheme, further reforms are required in almost all OECD countries. The shift from less to more decoupled support policies deserves the support of the farming and international communities and also that of the environmental community. Support policies causing the lowest production impact are the most efficient in providing income benefits to farm households. The more decoupled the policy the less trade will be affected, although quantitative constraints can increase both the degree of decoupling and the adjustment pressure on other countries. It is likely that more decoupled support policies will reduce some of the negative environment effects associated with intensive production and may create some positive benefits through more extensive farming.

The studies presented here are not exhaustive. Disentangling the effect of recent important policy changes from other factors that also affect production and trade is extremely difficult. New paradigms and new models are needed. Some of the most significant changes are very recent, and their impacts cannot yet be observed. The issue of decoupling will remain at the centre of the agricultural policy debate for some time. There is a need for research in this area to enable policy-makers to better understand the complex channels and mechanisms through which the new policies operate and what their effects are. ■

### For further information

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#### Box.

#### CHARACTERISTICS OF A MORE DECOUPLED SUPPORT POLICY

A support policy is likely to be more decoupled if:

- Support is not paid on the basis of output or variable factors of production.
- The rate of support is not dependent on any current market conditions.
- The level of support is not more than is required to meet the policy objectives.
- Farmers have maximum freedom to produce the commodities they wish to produce or to not produce at all, while remaining eligible for the payment.
- The payment of support is provided for only as long as necessary to achieve the policy objective and no expectation of updating is generated.



### For further reading

- OECD, 2001, **Market Effects of Crop Support Measures**, ISBN 92-64-19501-7, 25 €, 120 pages.
- OECD, 2002, **Agricultural Policies in OECD Countries: A Positive Reform Agenda**, ISBN 92-64-19967-5, 40 pages, [www.oecd.org/agr/](http://www.oecd.org/agr/).
- OECD, 2005, **Agricultural Policies in OECD Countries: Monitoring and Evaluation 2005**, ISBN 92-64-00956-6, 45 €, 250 pages.
- OECD, 2006, **Agricultural Policies in OECD Countries: At a Glance**, ISBN 92-64-02275-9.
- OECD, 2006, **Decoupling: Policy Implications**, see [www.oecd.org/agr/policy/decoupling](http://www.oecd.org/agr/policy/decoupling).
- OECD, 2006, **Special Issue on Decoupling Agricultural Support**, OECD Papers, Volume 5, No. 11, ISSN 1609-1914.

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