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Agricultural Policies and Risk Management: A Holistic Approach

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Paper prepared for presentation at the 108th EAAE Seminar ‘Income stabilisation in a changing agricultural world: policy and tools’, Warsaw, February 8-9, 2008

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⁽¹⁾ The views expressed in this article are those of the author and not those of the OECD or its member countries.

Abstract

This paper discusses the main issues and driving forces of government policies in the area of risk management in agriculture, with particular emphasis on good policy practices and the international environment. Four main ideas are developed. First, good policy and good policy analysis requires a holistic approach. This is particularly so in this policy area because risks interact prominently with both farm household strategies and government programs and regulations in terms of risk reduction impacts and the development of market tools and strategies. Second, the rationale for government actions which are based on market failure or equity concerns need to be defined in order to analyze its nature and scope, as well as to develop appropriate government measures. Third, the context of all support measures to agriculture must be considered because there are potential risk-related effects associated with most forms of support, particularly in OECD countries with high level of support to agriculture. Fourth, risk management measures need to comply with international agreements, particularly the Agreement on Agriculture of the World Trade Organization. Implications for good policy in this area have already been drafted by OECD and are useful for policy analysis.

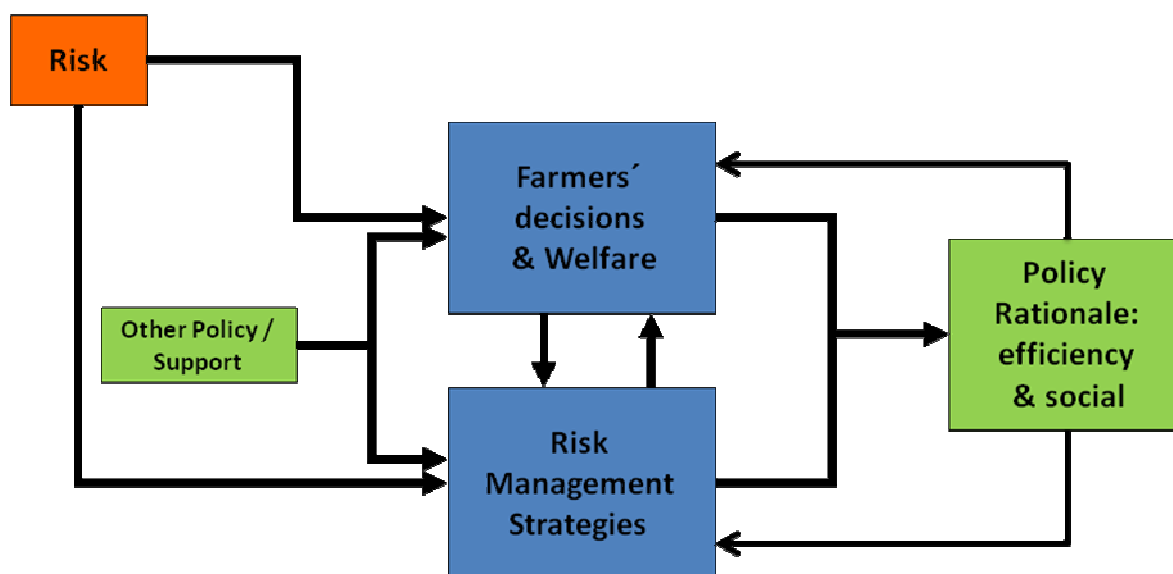
AGRICULTURAL POLICIES AND RISK MANAGEMENT: A HOLISTIC APPROACH

Introduction

Agricultural production is subject to many uncertainties. Any farm production decision plan is typically associated with multiple potential outcomes with different probabilities. Many events related to weather, market developments and other hazards cannot be controlled by the farmer but have a direct incidence on the returns from farming. In this context, the farmer has to manage the risk in farming as part of his whole management of the farming business.

Many risks directly affect farmers' production decisions and welfare. In response to the potential impact of these uncertain events farmers implement diverse risk management strategies in the context of his particular production plan, his portfolio of financial, physical and human capital, and his degree of aversion to risk. These risk management strategies may include decisions on-farm, changes in portfolio structure, use of market instruments, government programs, and diversification to other source of income. Indeed, many general agricultural support policies have risk management implications and interfere with risk management decisions. In addition, some governments implement specific agricultural risk management policies on the basis of efficiency or equity rationales. The complexity of these interactions requires that governments make significant efforts for coherence, particularly among different policies and between policies and the development of market strategies. Agricultural risk is an interrelated "system" in which markets and government actions interact with risks and farmers' strategies. Government programs may underpin the development of market strategies, but they may also crowd out market developments or on-farm strategies. The result of these interactions is the set of risk management strategies and tools that is available and used by farmers. The available strategies are not the simple addition of government programs, market instruments and on-farm decisions; they are all mutually interdependent.

Figure 1: Some interactions in an agricultural risk management system

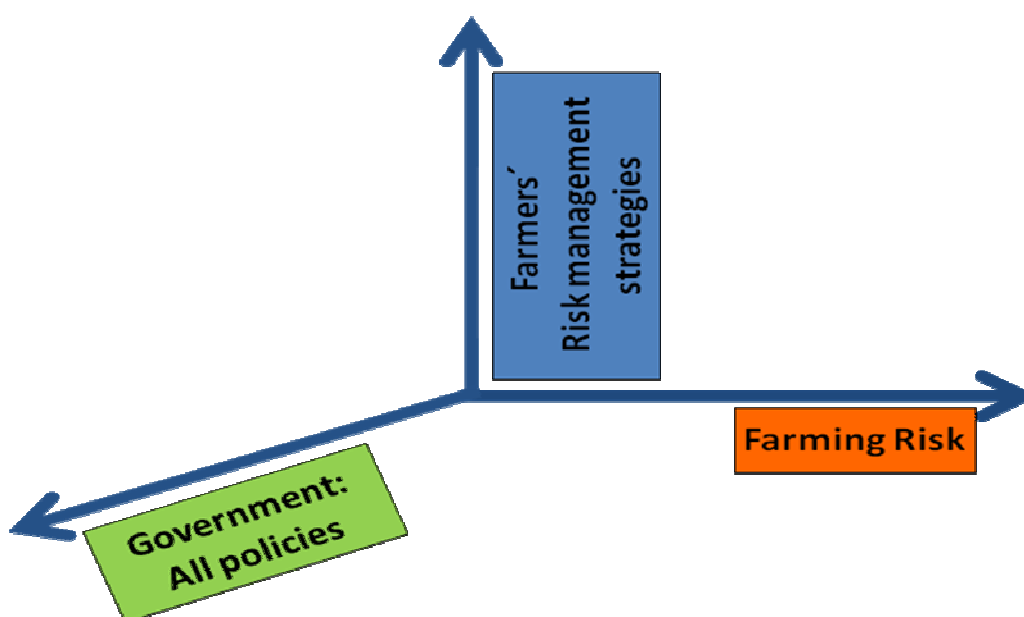


The objective of this paper is to analyse the context in which risk management strategies take place, taking into account the whole set agricultural policy interventions that have implications on risk management. All these policy actions are constrained by international agreements. This paper will also emphasise some good policy principles. The first section describes the main elements of agricultural risk management systems. Section 2 develops the ideas on the possible role of government and the economic rationale behind. Section 3 describes the context of agricultural policies in OECD countries. Section 4 emphasises the constraints imposed by WTO agreements. Finally, section 5 summarises some OECD policy guidelines in this area.

1. Agriculture risk management “systems”

A risk management system is composed of many different sources of risk that affect farming, different risk management strategies and tools used by farmers, and all government actions that affect risk in farming. Each risk may be dealt with a specific management tool or strategy. Each strategy availability, development and use is determined to a great extent by government actions. Some government actions are specifically designed to deal with some risk faced by farmers, and many actions have a direct impact on farming risk even if not specifically designed to do so. That is, a risk management system is characterized by a set of complex relations among three different axes that involve the original sources of risk, the available tools and strategies and government measures (Figure 2). The simultaneous determination of the elements in these axes generates an identification problem when analyzing risk management. When certain events or measures of variability of relevant farming variables are observed, they cannot be dissociated from the actions taken by the farmer to manage risk. Furthermore, these actions and observed variability are also directly determined by many government measures and regulations that affect both farming risk and available risk management tools. When some variability of farm income is measured, it already includes the impacts of the risk management strategies and government programs in place.

Figure 2: Three axes and the identification problem



Sources of risk in agriculture and relevant characteristics of some of these risks.

The idea of risk is associated with an event that implies some loss or damage and that can occur with some probability. It implies the existence of some uncertainty but, unlike this latter, the term “risk” emphasises the loss or negative part of the uncertainty. Sometimes these two terms are used as differentiated: risk implies the knowledge of some probabilities associated with an uncertain event, while uncertainty is applied to situations in which the probabilities are not known. However, this distinction is artificial since rarely is the probability distribution associated with some risk known with precision. Risk is typically measured through an indicator of dispersion or variability of a relevant farming variable. When this variability is measured on the basis of time series information or historical data, appropriate statistical techniques are required to disentangle the variability of values from the time trend of these values. Farmers need to manage or mitigate risk as measured by variability through different instruments, but they must adjust to trends and changes in the economic environment and in main farming variables.

Any classification of risk in agriculture is arbitrary. Boundaries between different sources of risk are often blurred. Five main sources of risk can be retained from the literature (Harwood *et al*, 1999): production, markets, finance, institutions, and other. Production risks are associated with all events that make final production outcome uncertain when production decisions are taken. They include most climatic events, such as floods or droughts, pests and diseases, and any other hazardous events that may affect yields in agriculture or production from livestock. Market risk refers to uncertainties associated with prices of inputs and outputs. It also includes any other uncertainties from the markets such as the conditions imposed by the contractors. Financial risk is associated with the variability of interest rates or of the value of financial assets, and the availability of credit when required. Risks associated with farm property or physical capital could also be considered under this same category. Institutional risk is increasingly considered as an important source of risk in farming. This includes all types of government actions and regulations that can affect the returns from farming. Changes in policies and laws such as environmental requirements generate institutional risk. A final group of sources of risks could be considered covering environmental risks, health-related risks and liability risk associated with the legal responsibility of farmers in relation to their production.

All these types or sources of risk have impacts on farm households’ welfare through the effects they have on income and wealth. The magnitude of those impacts depends on the characteristics of those risks and the way they enter into the income / wealth equation of the farmers. Risks can be characterised by the frequency of their occurrences and by the magnitude of the associated losses. More generally, risks are characterised by the whole distribution of risky events that include information on both the probabilities and the magnitude of the impacts of the events. One main characteristic of risk is its correlation with respect to other sources of risk. For instance, it is frequent that the output price is imperfectly negatively correlated with yields. Accounting for this type of correlation is essential in developing good risk management strategies at the farm level and good policy practices.

It is often argued that not all types of risk are equal. For instance, it is said that downside risk is more relevant for decision-making than upside risk. This way of using these concepts as alternative characteristics of risk is misleading. In fact, up-side and down-side risks are two sides of the same coin: a risk is in the up or down side in relation to the level used as the reference (the mean, the median, the mode...). Whatever the reference used, downside risk could not exist without some corresponding upside risk. More useful is the concept of downside risk as risk that has some asymmetries in its distribution, being skewed to the lower values. This situation is frequent in agricultural production risk. Yields tend to depend on variables such as average temperature and rainfall in a way that deviations from optimal temperature or optimal rainfall have negative impacts on yields, whatever the direction of the deviation. Under these circumstances, the distribution of yields tends to be biased towards the lower values and yields

that are more likely to be below, or far below, its value during a “normal” season, than above or far above this value.

A risk is systemic if it affects simultaneously a large number of farmers in the same geographical region. On the contrary, a risk is idiosyncratic if it affects only a single farmer. The spectrum in-between these two extremes of individual idiosyncratic un-correlated risk and systemic perfectly correlated risk is wide. In general, production risk tends to be more idiosyncratic while price risk tends to be systemic. The term catastrophic risk is usually applied to risks that have a very low probability of occurrence but very large associated losses. When the term “catastrophic” is applied at a regional or national level it requires also some correlation across farmers in the region; that is, some systemic nature. In this sense, a catastrophic event must be infrequent and severe for a region or country.

Farmers’ strategies

Farmers take actions to manage their risk for two main reasons. First, there are costs associated with risk (e.g. financial) or impacts on expected production and costs due to non-linearities of these functions (Just, 1975). Second, farmers can be, and usually are, risk averse; that is, they dislike risk and take measures and actions that help them to prevent, mitigate, or cope with risk. But this behaviour *vis-a-vis* risk events is not exclusive of farmers. All individuals –whatever their economic activity- take decisions to manage their own risk.

The first set of possible strategies is based on the appropriate portfolio of financial assets and economic activities of the household, and it is not exclusive to the farm households. The most obvious strategies used across board in different households and activities are related to the management of finances of the farm and the household. Good financial management can ensure appropriate liquidity in the case of a hazardous event that may affect consumption possibilities. Farm households –as any other household - can also diversify their sources of income not only with different products on the farm, but also with different sources of off-farm income. To the extent to which these other sources of income or wealth are not correlated with the returns from the farming activity, these strategies contribute to reduce the overall risk of the household.

There are also on-farm strategies that have the potential to reduce farming risk. Different production techniques, particularly the appropriate use of inputs such as fertilizers or irrigation, can generate different degrees of variability in yields and outcomes. Diversification or rotation in production can also contribute to the stability of returns.

Farmers can sometimes opt for different ways of marketing their production. Vertical coordination or different forms of contracting can contribute to reduce risk on prices and industry requirements. Cooperatives or other arrangements among producers can also contribute to reduce some market risks.

There are private markets in which specific agricultural risk can be pooled and/or shared amongst different agents. Different types of risk may generate different types of market solutions. For instance, production risk – that has a large idiosyncratic component - tends to be managed through insurance contracts, while price risk –which are typically highly correlated across producers and even regions - is dealt with future contracts. Insurance companies pool the production risk of different producers and then share this risk with their shareholders. There is private insurance for specific events, such as hail, in most countries. However, multi-peril crop insurance is rarely available without government subsidies. Future markets, when available, provide a possibility of hedging agricultural prices through standardised contracts. These contracts do not cover all price risks faced by an individual farmer, and there is always some “basis” risks for the farmer. More sophisticated options and derivatives markets associated with the futures are generally available.

Finally, farmers may count on government programs or actions in order to manage their risk. Some of these actions are found in the context of or coordinated with market instruments. Some are specific to agriculture, while others are more general. Some focus on risk reduction, while others provide just support. Furthermore, uncertainties about government actions, both in terms of programs and in terms of legislations that affect farming, can contribute to generate additional risk. The possibility of a change in the environmental legislation or on the agricultural support programs generates some risk that directly affects farming.

Government action and institutional framework

General economic policy is the first, and probably most important, government action to facilitate appropriate risk management. A good business and economic environment contributes to the development of different market solutions for risk pooling and risk sharing and for good financial management. Macroeconomic stability and a secure legal framework are the basis for the development of both farming businesses and markets for agricultural related risk. The proper functioning of markets for inputs and outputs, including credit, constitutes a good framework that farmers and other agents can use to manage their risk.

General social and fiscal policies in OECD countries generate a system of income smoothing normally attached to tax systems and safety nets provided by social programs. Sometimes, farming activities are subject to different provisions than other economic sectors both in terms of the fiscal or social security systems. This special treatment can have an impact on the capacity of those systems to deal with risks from farming. For instance, very generous taxing systems for farmers may jeopardize the income smoothing role of income taxes, and taxing systems based on calculated income from modules may eliminate this income smoothing role.

Agricultural support policies, even if not oriented to reduce risk, have a significant role in risk management. Many OECD countries support their farmers with different policy measures. These policy measures generate an additional source of income that may reduce the risk exposure and the vulnerability of farmers. When the level of support is large, there may be smaller incentives to implement risk management strategies or to participate in risk related markets.

Some agricultural support instruments and mechanisms are directly designed to affect risk or the availability of risk management tools. This is the case of deficiency payments and counter-cyclical support measures, or insurance subsidies. Farmers can benefit from the use of these instruments in two ways: getting the support that they involve in terms of current and expected transfers, and profiting the risk reduction that they may involve. Many of these measures interact with other measures, particularly with on-farm strategies and market tools. Government programs can potentially crowd out the development of appropriate market tools or on-farm strategies.

Finally, government is responsible for laws and regulations that directly affect farming activities, with potential impact on the costs and returns. These include legislation in areas such as food-safety, environment, labour, and land. Government sometimes also intervene in the development of different institutional arrangements. For instance, most countries providing insurance subsidies, such as Spain or the United States, facilitate the creation of agricultural insurance consortiums or of some of the standards in the design of the insurance policies, or even some institutional arrangement between private companies and government subsidy rules, that may affect the development of the insurance market beyond the effects of the subsidy.

Another area in which institutional arrangements are influenced by government action and that are crucial for the risk management environment is catastrophic risk. Most governments take some *ex post*

action whenever a catastrophic event has occurred. Some governments have rules in order to decide what constitutes a catastrophic risk and what type and size of action is appropriate. There is usually an institutional arrangement that involves farmers, independent agencies, local governments and national government. This arrangement determines who takes the initiative and how this initiative or request for catastrophic agricultural aid is pursued. There are also countries in which no formal institutional arrangement is foreseen and decisions on whether and how to provide catastrophic aid are made *ex post* in an *ad hoc* manner. These arrangements, lack of arrangement, or government *ad hoc* responses contribute to defining the responsibilities for managing important types of risks.

The main elements in terms of sources of risk, management strategies and government actions explained in this section are listed in Table 1. These lists are drafted independently with no intention of ordering or highlighting any specific relationships among elements of different lists.

Table 1: Lists of main sources of risk, management strategies and government actions

Sources of risk	Risk management strategies	Government actions / framework
Production	On-farm production techniques	Business and economic environment
Market	Market tools: insurance, futures...	Social and fiscal policies
Financial	Savings, credit and off-farm assets and income	Generic agricultural support
Institutional risk	Government programs	Risk-related agricultural programs
Other sources of risk	Marketing	Regulations and institutions

Source: OECD Secretariat

2. Is there a role for Government?

It is tempting to think that risk is always bad because it can frustrate the expectations of consumption or well-being of farm-households. However, this idea is misleading because there are often some agents in the economy – some of them farmers - who can benefit from risk because they took the right combination of risks. This incentive can be an important engine for good schumpeterial entrepreneurship, looking for opportunities that need an incentive to be discovered. Farming, as well as other sectors and the economy as a whole, can benefit from this entrepreneur activity that can be driven by incentives or higher returns attached to some risks. There is no economic justification for trying to “eliminate” the risks, but rather to facilitate mechanisms to manage these risks. Efficient mechanisms should help to select the risks that are covered, according to their associated costs and benefits for the economic agents and society as a whole.

Market Failure

There are strong arguments in the literature in favour of a role for the government in the area of risk management in agriculture. The first set of arguments is related to the lack of efficiency of market mechanisms in order to allocate resources for risk management in agriculture. This efficiency argument is based on the possibility of market failure in agricultural risk management markets. If markets depart from the perfect competitive ideal, market equilibrium fails to be Pareto optimal.

The departure from competitive markets may be due to the existence of externalities or public goods. There are not many risks that have clear externalities attached except for risks from epidemic diseases that can affect other plants or animals, or for catastrophic events that can affect the possibilities of quick

recovery of a country or a region and the well functioning of the economy. In both cases, efficient government action should be able to keep the appropriate incentives for farmers to take risk management decisions.

The existence of market power is also a possible departure from competitive markets. It can occur that crop insurance markets are very concentrated with few companies able to collude. Government institutional arrangements could facilitate the interaction and communication among insurers, increasing the possibilities for non-competitive behaviour.

However, the departure from competitive markets that has potentially more significance for risk management is the existence of asymmetric information. If the farmer can hide some of his actions so that these cannot be observed and incorporated into the insurance contract conditions, there exists moral hazard. Once insured, farmers have reduced incentives to take proper care of his production. Moral hazard may cause an insurance market to fail. Additionally farmers can sometime hide some information that is relevant for insurance. In this case the insurer is not able to distinguish between “risky” farmers and “non-risky” farmers. This inability to separate the contracts for farmers with different risks or characteristics implies the existence of adverse selection: more risky farmers have larger incentives to contract an insurance policy than less risky farmers. This can also cause markets to fail.

In addition to the adverse selection or moral hazard phenomena, systemic risks such as production risk typically presents high transactions costs of reinsurance. It is expensive to find agents willing to take the risks associated to a large portfolio of farmers’ policies whose risks are very much correlated. These high transactions costs can also make markets fail to meet demand and supply for risk management tools.

In the absence of full costless contingency markets for agriculture, risk averse farmers are likely to produce below the optimum. However, this does not automatically imply there is a need for government action. The main objective of improving efficiency in risk management in agriculture and in the economy as a whole requires answers to the following questions: Is risk in agriculture higher than in other sectors? Is the absence of contingency markets deeper than in other sectors? Is government intervention cost effective? What kind of intervention could better contribute to improve efficiency in risk management?

Equity

The second set of arguments in favour of government intervention in agriculture risk management is based on equity considerations. Government may decide to help farmers in situations of economic or social distress derived from some type of hazardous events. There are general instruments from social policy that can be applied to farmers. Some of them have specificities for farmers. There are also often agricultural specific measures that are taken *ex post* in order to help “poor” farmers adjust after a shock. However, if the purpose is to help to adjust from a sudden hazard that risks bringing household consumption levels towards poverty, the criterion for such aid to be delivered should be proximity to the poverty line, and it should be referred to all farm household income. This type of welfare measure may not be appropriate to address structural poverty that may require longer run policies.

Some implementation issues

Some relevant implementation questions arise whenever some policy action is being developed for risk management. First, policy makers should focus their attention on the shocks to individual income or to individual variability rather than on aggregate measures of risk or variability. This is important not only for the variance but also for the covariance between different risks affecting farm income, such as prices and yields. Looking at individual indicators allows to identify the population that suffers from risk and the

scope of this suffering. There is a role for academic research to advance in this area to better understand the linkages between individual and aggregate risks and variability.

For sudden effects that are infrequent but severe – what is normally called catastrophic events - there is a debate on the convenience of *ex ante* or *ex post* action. *Ex ante* programs fix rules on triggering variables, values or events and on the amounts of aid. *Ex post* actions imply an *ex post* discretionary decision on whether the event deserves disaster aid, what amount and with what criteria.

Information is the key element that may impede markets to work. There is potential for government action to improve the availability of such information and to reduce the information asymmetries. There may also be scope for government action in the area of training to familiarize farmers with the main instruments and tools that he can potentially use.

Government actions would better be oriented to contribute to the creation or enhancement of markets for risk management tools and other risk management strategies. General support programs have an impact on risk management but are not well targeted to that objective. Any evaluation of possibilities for government action needs to account for the interaction with other government programs, market mechanisms and different sources of risk.

3. The context of domestic support to agriculture in OECD countries

Any government initiative on the area of risk management in agriculture needs to account for the current context of existing support measures in OECD countries. The Producer Support estimate (PSE) of the OECD is the international standard for measurement of this support. The categories of measures in the OECD classification follow implementation criteria (Table 2). Even if they do not include categories that are specific to group risk related measures, there are many risk related support measures that are included under different categories.

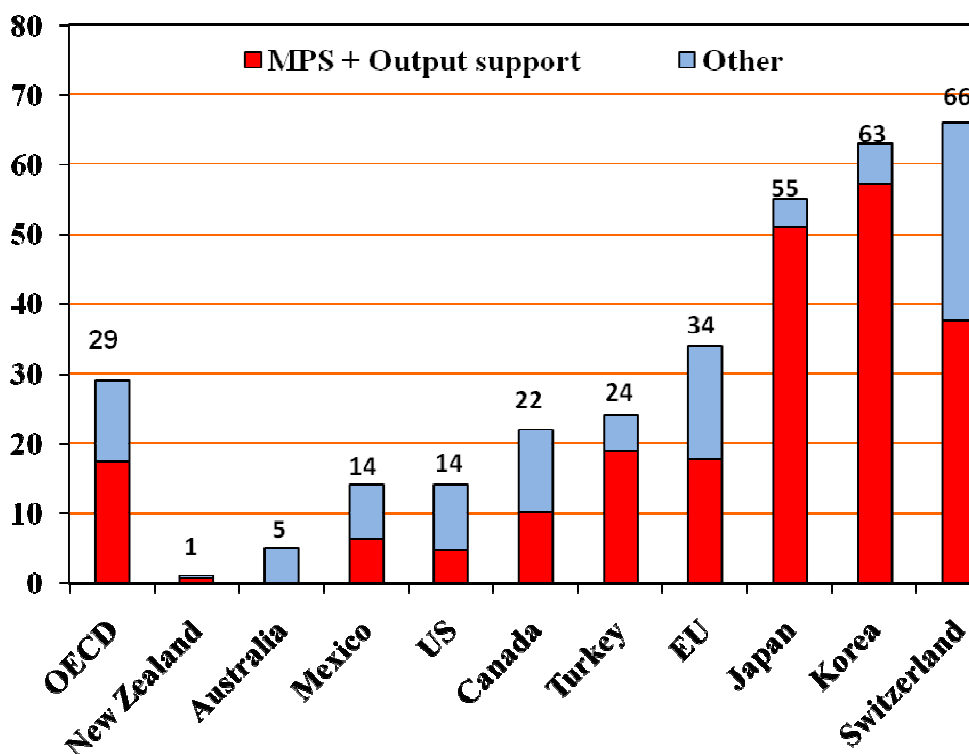
Table 2: Classification of Agricultural Support according to the OECD

Support to producers (Producer Support Estimate, PSE)
A1) Market price support (MPS): $Q_s * (P_s - P_w)$
Budgetary payments (based on implementation criteria):
A2) Payments based on Output
B) Payments based on input use
C) Payments based on current A/An/R/I, production required
D) Payments based on non-current A/An/R/I, production required
E) Payments based on non-current A/An/R/I, production not required
F) Payments based on non-commodity criteria
G) Miscellaneous Payments
A/An/R/I = Area, Animal numbers, Receipts or Income
General services to the sector (GSSE)
R&D, schools, inspection, infrastructure, marketing/promotion, public stockholding, miscellaneous
Total Support Estimate (TSE)= PSE + GSSE + Consumer subsidies

Figure 3 presents the percentage PSE in a selection of OECD countries. This indicator represents the percentage of farm receipts that are due to agricultural support measures. On average, 29% of farmers' receipts in OECD countries are due to government policies. This number is above 55% for countries such as Japan, Korea and Switzerland, 34% for the European Union, and 14% for the United States. These

indicators include, amongst other policies, market price support (MPS) provided through border measures and payments based on output. In fact, these two categories of support are directly coupled to production and continue to represent— on average - more than half of total support in OECD countries.

Figure 3: %PSE in selected OECD countries 2004-06



Source: OECD PSE/CSE database, OECD, 2007.

Market price support and payments based on output often have a countercyclical nature with respect to prices. Border measures generate price gaps between domestic and international prices and they are often complemented with variable intervention measures linked to administrative intervention prices. This provides stability in domestic prices. Many payments based on output in OECD countries are deficiency payments that cover the difference with respect to a target price. The two most important examples in this respect are the European Union where large proportions of support continue to be given as market price support, and the United States that has significant programs of a deficiency payments type. Given the amount of this type of support and its share on total support, this is probably the main risk reducing set of measures in place in OECD countries (OECD, 2004).

Several OECD countries (Spain, Mexico, Japan, US and Canada) provide crop insurance subsidies in different forms and with differing scopes. Countries implementing revenue insurance programs are less numerous (some Canadian provinces and the US). These payments are classified in the PSEs as payments based on variable inputs or as payments based on area, depending on the implementation rules.

Some OECD countries provide payments based on revenue or income “losses”. This is the case of the Canadian CAIS program and the United States Counter-cyclical payments program that was the successor of the market loss assistance payments provided since 1998. The Mexican ASERCA marketing payments

program is based on a so-called target income, but is in fact a kind of deficiency payment per unit of output.

Other countries have safety nets types of measures of different types. There are systems based on savings such as the former NISA in Canada and the Managed Deposit Scheme in Australia. There is transitional assistance for farmers leaving the sector in some countries (Australia, Ireland, Korea) or welfare assistance for farmers having temporal difficulties in the context of a disaster (Australia). Finally, there are income smoothing taxation systems in several countries, such as Australia and Sweden.

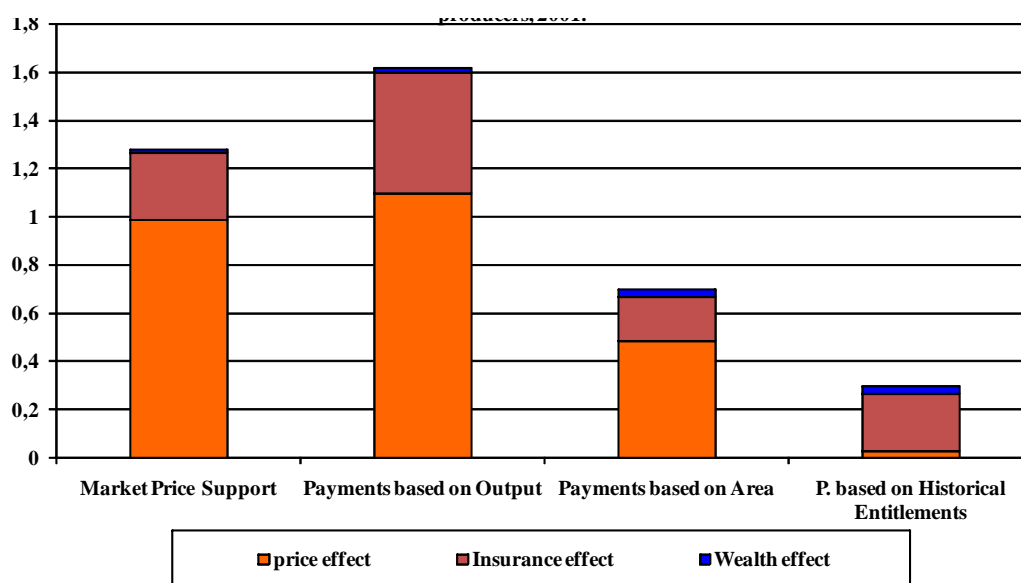
Most countries have some kind of “disaster” payments triggered by natural catastrophes. For instance, drought and disaster assistance based on losses exist in, for example, Canada and Mexico. Other countries contribute with some public money to disaster funds to be triggered when a calamity occurs (France). Many countries (particularly national expenditure of members of the European Union, but also Japan) provide interest concessions in an *ad hoc* basis after a disaster. There are also several countries that consider high energy prices as a “shock” that requires some compensation from public money (several EU member plus Mexico and Japan).

Current or recent agricultural policy developments and debates follow different directions in terms of risk management. For instance, the discussions on the 2008 Farm Bill in the United States point in the direction of continuing and reinforcing the counter-cyclical nature of an important part of the payments. Discussions in Canada follow the same direction even if less oriented to commodity specific programs. On the contrary, the discussion around the European Union’s common agricultural policy is much more oriented to reinforcing the decoupled nature of the main support measures.

4. PSE support affects risk and has a risk related response

All PSE support measures affect risk and has risk related responses and effects (OECD, 2001). Even a program that has genuine “decoupled” income support to farmers would have an impact on farm household income. This, in turn, will imply an income effect in labor / leisure decisions and wealth effects in production for risk averse farmers (Henessy, 1998). Many government regulations (such as environmental laws), input subsidies and general services affect yield variability and, therefore, variability of receipts and income. Coupled support always affects farm receipts and input use, and therefore production variability. Some measures in all categories have explicit stabilizing mechanisms (intervention price, deficiency payments, stabilization payments, crop and revenue insurance, countercyclical measures...). Furthermore, all policy measures potentially generate some policy risk or uncertainties about future changes in policy.

**Figure 4: an example of estimated production impacts of risk averse farmers
US coarse grains producers, 2001**



Source: OECD, 2004.

OECD (2004) estimated the impacts on variability of aggregate receipts of different aggregate categories of PSE support measures. It was found that most PSE categories reduce aggregate revenue variability. Particularly, market price support was found to reduce variability in all the cases that were analyzed. However, variability reduction is not proportional to the amount of support and there are payments and programs that have more risk reduction effects than others. This reduction in risk implies risk-related response and effects in production as illustrated in Figure 4. Insurance effects can be dominant for categories of support that are more decoupled from production and have relatively smaller price effects.

The interaction among policy measures has proved to be very significant (OECD, 2005). In general, risk reducing payments crowd-out the use of market strategies, particularly if they cover the same source of risk or risks that are highly correlated. There can be perverse effects of risk reducing support that ends up increasing farmer's income variability, particularly when other substituting risk related programs, tools or strategies are in place or can be used by farmers. These results underline the strong need to co-ordinate all risk reducing measures and to evaluate their impact on other tools and strategies.

5. The international context: WTO boxes and notifications

Policy measures related to agricultural risk management, like any other agricultural support measure, need to comply with the rules fixed for domestic support in pillar 3 of the agreement on agriculture of the World Trade Organization (WTO). There can be measures of this type in any of the three boxes: amber box of measures that potentially distort trade, blue box direct payments under production limiting programs, and green box so-called minimally distorting measures. There can also be measures that are notified under the *de minimis* commodity and non commodity specific support up to 5% of value of production.

Green box measures have to comply with the basic criterion of having "...no, or at most minimal, trade-distorting effects or effects on productions". There are also specific criteria for different categories of measures, some of which are related with risk management, particularly three: decoupled income support,

income insurance / safety net, and natural disasters / crop insurance. Of course, the measures under “Decoupled income support” have important risk management implications, in principle related with the corresponding wealth effects and the financial management of the farm household. Up to now, the main user of this category is the United States. Its Direct Payments program is declared under this category. It is likely that the European Union will make large use of this category for the Single Payment Scheme in future notifications. Around 6% of all green box support notified to WTO belongs to this category (Anton, 2007).

The category “Government participation in income insurance and income safety net programs” is hardly used, with around 0.1% of notified support. Among OECD countries, Australia has notified its Farm Management Deposit Scheme, but with no payment made since the support component of this program is due to taxing provisions. Canada notified Alberta Farm Income Disaster Program and Prince Edward Island its Agricultural Disaster Insurance Program. Non-OECD countries have used this category for a diversity of programs, some of them related to crop insurance; Argentina, support for compulsory hail, work accident and life insurance (special tobacco fund) and the creation of a solidarity fund for hail insurance coverage (since 1997); Costa Rica: Insurance services, including crop insurance; India: Crop Insurance Scheme and Farm Management Deposit Scheme (no payment made); Sri Lanka: Income Insurance and Income Safety Net Program.

“Payments for relief from natural disasters (including participation in crop insurance schemes)” includes 2% of all green support notified to WTO. Among the notifications there are mainly disaster payments of different kinds (Table 3). Some of them are programs targeted to specific farmers in need after a disaster (e.g. Australian Exceptional Circumstances Relief Program), but most of them are broader compensation to farmers after the occurrence of a disaster.

However, the main insurance subsidy programs in the United States, some European Union countries like Spain, Canada, and to lesser extent Japan, are not declared under this green box category but under the non-commodity specific *de minimis*. The main impediment that many countries may have found to declare their insurance programs under the green box is due to the first specific criterion demanded for this type of support: the requirement of a formal recognition by government authorities of a natural disaster, and a production loss of 30% with respect to preceding three years average or five-year olympic average. The draft modalities in agriculture in the Doha Round Negotiations (WTO, 2008) include a revision of paragraph 8 of Annex 2, which refers to this category of measures. This new draft implies different requirements for direct disaster payments as compared with participation in insurance programs. For the latter no formal recognition of disaster by the government is required and the 30% loss triggering level is required to be based on the average production in a period demonstrated to be actuarially appropriate. The new draft also includes a third type of program under this same category: destruction of animals or crops to control or prevent pests and diseases.

Table 3: Notifications from OECD countries in the green box under category “Relief from natural disasters (including participation in crop insurance schemes)”

Country	Programs
Australia	Rural Adjustment Scheme Tropical fruit producer assistance (1996) Exceptional Circumstances Relief Payment contribution to regional Disaster fund interest subsidies (State funding)
European Union	Compensatory payments in respect of weather, restoration of agricultural potential and natural disasters (re-plantation of olive grove in 96)
Hungary	Compensation of damage caused by drought
Japan	Subsidy on agricultural insurance premium; natural disaster relief loans
Korea	Compensatory payments for losses caused by natural disaster
New Zealand	Administrative cost of providing advisory services to farmers affected by drought and paying army personnel for the distribution of water to farm households
Norway	Compensation for crop damage due to natural disaster
Poland	Protection against and relief from flood and restoration of agricultural production
Slovak Republic	Partial damage reimbursement
Slovenia	Compensation for production losses caused by disaster
United States	Non-insured Crop Disaster Assistance Program (NAP); compensation for feed or forage losses, for loss of tree seedlings, for livestock losses; emergency loans

Source: WTO Notifications

In addition to the insurance subsidy programs, other programs from OECD countries directly related with risk management are notified under *de minimis*. The United States has declared Multiyear Crop Disaster Payments and Crop Market Loss Assistance payments and their inheritor Counter-Cyclical Payments program. These latter are payments based on historical land, but counter-cyclical with current crop prices. Canada has also notified under *de minimis* its former Net Income Stabilisation Account (NISA) program.

6. Guiding Policy Conclusions

Strategies to reduce income risk depend on the characteristics of risk and require an integrated set of tools and instruments. According to OECD (2000) the role for the government in risk management is: to provide a sound business environment with competitive markets and clear regulations; to facilitate the development of market mechanisms; and when markets fail, to provide instruments according to reform principles. These OECD reform principles are: intervention should be effective and cost-efficient, minimally distorting, delivered in a transparent, decoupled and targeted way without undermining the development of private/market solutions, or hindering the adjustment capacity of the sector, or encouraging rent seeking (limit moral hazard/adverse selection).

Hence the need to have an integrated approach to risk management systems becomes evident. The interaction among risks, strategies and interventions is critical. However, this seems not to be the case in most OECD countries where policies have sometime contradictory objectives, most support is linked to production and *ad hoc* intervention often gives farmers contradictory incentives.

There is a need for more information on the mechanisms available, their utilization and performance, and the assessment of their economic impacts. The existence of Market Failure and /or specify equity concerns need to be analysed and assessed. There is a role for academic research on this area.

Other roles for government include training, development of information sources that may reduce information asymmetries in risk related markets, and ensuring an appropriate integration between private and public initiatives. Sharing of policy experiences among different countries can also be an important source of knowledge and policy improvements.

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