

# Perspectives on Addressing Market Instability and Income Risk for Farmers

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Paper presented at a Joint AES and SFER Conference on 'The Common Agricultural Policy Post 2013'

Edinburgh

29 March 2010

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## 1 Introduction

### 1.1 The re-emergence of market stability on the agricultural policy agenda

Price and volume instability is a general feature of agricultural markets. Addressing price instability was one of the earliest motives for government intervention in the agricultural sector. Market stability was listed as one of the major objectives of the Common Agricultural Policy (CAP) (Article 39, Rome Treaty). The policy instruments used by the CAP were by and large successful in insulating EU domestic prices from some of the substantial volatility experienced on world markets. However, the use of market intervention instruments in the EU to address the objective of price stability became increasingly intertwined with, and dominated by, their use to provide price support as a means of transferring income to the EU farm sector. Market regulation primarily implemented to provide price support ensured price stability as a by-product.

Over time, the EU model of market price support became increasingly untenable in the face of its rising budget cost, increasing environmental criticism and the difficulties it created for the EU's relationships with its trading partners. The EU embarked on a move to greater market orientation in its agricultural policy. Successive CAP reforms gradually switched support from market and price management to direct payments, which since 2005 are largely decoupled. The decoupled single payment scheme provides a significant and stable contribution to farm income, although with notable differences across countries and farms according to the historical distribution of support between different sectors of agricultural production.

This more market-oriented CAP means that farmers must now take responsibility for managing those risks that were formerly absorbed by market and price support policies. At the same time, EU agriculture is increasingly exposed to price fluctuations as a result of trade liberalisation. The 2007-08 food price spike on global food markets and the sudden collapse in prices after the middle of 2008 particularly for grains and dairy products brought home this new vulnerability to farmers and policy makers with a vengeance. As a result, no proposal for CAP reform or for the shape of the CAP

after 2013 is now complete without some reference to the need for measures to help farmers and the food chain with risk and crisis management.<sup>1</sup>

Reflection on risk management instruments within the CAP has developed rapidly in the past decade. A first analysis of risk management tools for EU agriculture was provided by the Commission in 2001 (Commission, 2001). The Fischler CAP reform in 2003 incorporated a Commission declaration “to examine specific measures to address risks, crises and national disasters in agriculture” and “present a report, accompanied by appropriate proposals, to the Council before the end of 2004.” This resulted in a Commission Communication on risk and crisis management (Commission, 2005a). It is interesting to note the Commission’s view in the Communication that “[Risk management tools] cannot and are not intended to offer the kind of guarantees provided by the former CAP, but would rather help the farm business withstand temporary shocks and improve its access to finance for the development of its activities. It is with this perspective that the development and availability of risk management instruments might usefully be encouraged” (Commission, 2005a).

Individual Member States operated various types of risk management schemes on a national level under state aid guidelines, but the first initiative with EU financial participation was taken as part of the CAP Health Check in 2008. This permitted Member States to grant financial contributions to premiums for crop, animal and plant insurance against economic losses caused by adverse climatic events and animal or plant diseases or pest infestation. It also allowed Member States to provide for financial compensation to be paid to farmers for economic losses caused by the outbreak of an animal or plant disease or an environmental incident by way of financial contributions to mutual funds. Since then, further studies on the feasibility of extending the range of risk management instruments in the CAP have appeared (for example, Bielza Diaz-Caneja et al, 2008; Berg et al., 2009). Following the 2009 milk crisis, the Commission established a High Level Group to examine, inter alia, ways to ensure price stability in dairy markets following the end of quotas in 2015.

Most recently, the Agricultural Council held a discussion on market management measures post 2013 on the basis of a Spanish Presidency paper where some divergence of emphasis on the appropriate balance of measures was evident (Council, 2010a). The Council Conclusions reported that “Many ministers supported the presidency’s suggestion of examining the possibility of complementing existing market management measures provided for in the single CMO and made suggestions, such as the creation of income insurance schemes, the strengthening of producer organisations and interbranch cooperation, futures markets and the setting up of a crisis fund. ... A

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<sup>1</sup> A couple of examples can be quoted. A recent Declaration by the New Member States on the CAP post-2013 noted that “In order to face up to increasing external competition and instability of international agricultural markets, it is necessary to ensure mechanisms of market stabilization. They are essential to providing a safety net that stabilizes production conditions in the future, thus ensuring food security in the EU. Crisis and risk management instruments, which would allow crisis prevention instead of solving the problems when they have already occurred, should not be left aside” (Polish Ministry of Agriculture, 2010). See also the Spanish Presidency paper to the February 2010 Agricultural Council “The period beginning in 2013 is shaping up as a challenge for European agricultural markets. New trading conditions, new financial perspectives, the disappearance at Community level of export refunds - which will require all Community products to position themselves on the world market under competitive conditions - and greater market volatility, amongst other factors, make for a more uncertain backdrop against which the CAP will have to continue to meet its objectives. The EU must have an agricultural model with the tools necessary to stabilise markets and deal with price volatility, a model in which the economic activity of agriculture provides farmers with fair incomes that reflect their contribution to society and in which farming is the mainstay of life in rural areas”. (Council, 2010b).

substantial number of ministers agreed that the future CAP should provide for a financial mechanism allowing the EU to respond rapidly to serious crises which offers flexibility in responding rapidly to such cases....A number of ministers considered that market orientation in European agriculture could be further improved and insisted that further efforts to improve competitiveness would offer the best safety net. Some made it clear that any new market measures should not come on top of existing ones and also expressed doubts with regard to the creation of a financial mechanism to deal with crisis situations, as this would involve additional expenditure” (Council, 2010a).

Our purpose in this paper is to review the state of this debate with a view to identifying a possible way forward post-2013.

## 1.2 Agricultural risks are broader than market instability

At the outset, we should recognise that, as the OECD has recently emphasised, agriculture is subject to many risks, of which market instability is just one (OECD 2009). These risks can be categorised in various ways. The OECD distinguishes between production, market, institutional, personal and financial risks.

Production risk is due to unpredictable weather and performance of crops and livestock. Market risk is related to uncertainty about the price of outputs, and sometimes also inputs, at the time production decisions are taken. Institutional risk is due to government actions and rules such as laws governing disposal of animal manure or the use of pesticides, tax provisions and payments. Personal risks are due to uncertain life events such as death, divorce, or illness. Financial risk results from different methods of financing the farm business. The use of borrowed funds means that interest charges have to be met before equity is rewarded which may create risk due to leverage. Additionally there is financial risk when interest rates rise or loans are unavailable. In addition, the food chain as a whole can face risks such as bioterrorism or the rapid loss of market confidence due to a food safety incident.

What is the relative importance of these different kind of risks? OECD (2009) compare the results from a number of producer surveys and output price risk is ranked as either top or second place in every study. In this paper, we limit ourselves to market instability (price) risks. We do not address the issue of production risk from losses due to weather damage, crop pest infestation, or animal disease outbreaks. This is currently a very live issue in CAP debates, where various options such as insurance or the creation of mutual funds are being actively considered.<sup>2</sup> Although there are indications that production risks in Europe are also growing (greater likelihood and frequency of extreme weather events, greater likelihood of exotic pest or disease outbreaks as a consequence of globalisation), the greater interest in risk and crisis management policies is largely driven by the experience and fear of increased price volatility.

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<sup>2</sup> There are a number of studies which investigate climatic and sanitary risks in EU agriculture and examine the role and the functioning of agricultural insurance as a risk management tool, see for example, Bielza Diaz-Caneja et al., 2008.

### 1.3 Measures to deal with market instability

We have shown that price instability is of increasing concern to farmers and policy-makers in the EU. The question we address in this paper is whether this requires the introduction of new or the re-introduction of old instruments of public intervention, or whether adequate private risk management schemes will emerge to assist farmers to cope?

We structure the discussion around four ideas or questions. First, we ask whether market instability in agriculture is a greater threat to efficient and sustainable agricultural production than the instability experienced by other sectors. Is agriculture different when it comes to price risks? We take a brief look at the evidence of market instability and whether this is increasing or not. To the extent that volatility is expected to increase in the future, this raises the political and economic returns to measures which address the problem.

Second, we review policies that can help to mitigate or reduce the risk of price volatility. While CAP market regulation was effective at doing this in the past, the major difficulty is the negative spillovers that it causes for other countries. Stabilising prices domestically means shifting this instability to world markets. As a result, WTO disciplines limit the actions that an individual country can take to stabilise prices for its own farmers in the interests of creating a global public good – a more stable world market – for all its member countries. Nonetheless, we explore options which could help to lessen the extent of world market price volatility and thus the extent to which the EU imports price instability from the rest of the world.

The third idea we explore is the possibility of transferring the risk of price instability out of agriculture through market-based instruments. Farmers have the option of transferring price risk through the use of forward, futures and other derivative markets, but use of these market-based risk management instruments is much lower in the EU than, for example, in the US. There is some evidence that this is because the availability of public market management instruments to reduce price risk had the effect of crowding out private market-based solutions as well as reducing the degree of farmer interest in these solutions. This suggests that increasing price volatility could lead naturally to greater use by farmers of these options, but there may be a role for public intervention to encourage this trend.

The fourth idea is to explore policies which help farmers to better cope with income instability. Risk management strategies start with decisions on the farm and in the household including to diversify activities on and off-farm. Farmers' use of market-based instruments to transfer risk is a further important aspect of risk management. Nonetheless, on occasion these measures alone may be insufficient to protect farmers' incomes in the face of a significant price decline. Governments have available a portfolio of different measures to assist farmers in these circumstances, including counter-cyclical direct payments, revenue or income insurance, state aids and other crisis management measures. We explore the rationale for extending the use and scope of such instruments in the future CAP.

## 2 The damage caused by market instability

### 2.1 Is agriculture different?

Price volatility is a part of the signalling function of prices to reflect changing market conditions, and thus has a useful role to play. However, problems arise if price signals are so noisy that it is hard to extract useful information and if the volatility is excessive. It is frequently argued that price instability in agricultural markets is greater than in other markets, and that farmers may have a lower 'pain threshold' in dealing with this volatility than enterprises in other sectors.

The analysis of price volatility for agricultural commodities starts with their demand and supply characteristics. On the demand side, in high-income markets, consumption behaviour is usually characterised as being unresponsive to changes in price. This means that first-stage handlers are relatively weak buyers of any additional volumes above the 'normal' or 'expected' levels, thus precipitating a substantial fall in price if the volumes offered exceed these 'normal' levels (Keane and O'Connor, 2009). Conversely, when volumes fall below these 'normal' levels, consumers are willing to increase the amount they pay to secure their normal level of supplies. On the supply side, agricultural production responds with a lag as well as being subject to random weather-or disease-induced shocks. These factors combined give rise to significant observed price volatility in agricultural markets.

The combination of uncertain prices and a production lag can also give rise to cycles in prices, as illustrated in the cobweb model. While the cobweb model in its textbook form is hard to validate empirically, time series of agricultural prices do exhibit cyclical behaviour, often punctuated by extreme price spikes in response to unexpected events. A further characteristic of market volatility in vertically-linked food markets is that the extent of volatility differs greatly at different levels of the food chain. Volatility at the final consumer and retail level is dampened considerably relative to the price volatility experienced by the primary producer due to the size of the farm-retail marketing margin and the pricing behaviour of market participants, and in particular the large retail operators.

The argument so far assumes a closed economy. In an open economy, prices are more stable to the extent that countries adjust to domestic production volatility through changes in net trade, but on the other hand the economy is more vulnerable to importing price instability arising from world price shocks. Because world markets are very thin, with relatively small amounts of product traded – in the case of dairy products, for example, only 7% of output is traded and just four countries account for more than 80% of supply (O'Connor et al., 2009) – there is a good chance that the destabilising influence of participation in the world market exceeds its stabilising impact.

There is thus a strong presumption that the amplitude of price volatility is greater in agricultural markets than for non-agricultural products. This is further underlined by the belief that agricultural products are generally sold in competitive (flex-price) markets, while manufactured goods are sold in oligopolistic (fix-price) markets where prices are much stickier and the response to exogenous shocks is more likely to result in volume changes rather than changes in price.

Price volatility increases the risk premium attached to investments and thus lowers the rate of investment and thus the rate of agricultural growth. In a volatile environment, it can be difficult to extract the true price signal from the noise, leading to an inefficient allocation of resources. Price volatility at all levels of the food chain increases contract risk, makes long-term planning more difficult, and at the processing level discourages investment in product innovation, brand promotion and customer relationships (see, example, the responses of dairy processors to the problems caused by price volatility in Keane and O'Connor, 2009).

Do these characteristics of agricultural markets justify particular public intervention measures to address price volatility? One argument increasingly heard in the public debate should be immediately dismissed, namely, that price instability threatens EU food security. Food security in the EU is largely an access issue. Access is determined by income, distribution and safety nets; the EU has very high per capita incomes, equitable income distribution and excellent safety nets (Schmidhuber, 2009). In any case, consumers are only little affected by price volatility in agricultural markets because of low vertical price transmission, the low share of agricultural raw product value in final product value (approximately 25% on average) and the low share of household food expenditure in total household expenditure (14% in 2007) (Commission 2008). The 2007-08 price spike was estimated to reduce the purchasing power of European consumers on average by just 0.7% (Commission 2008a).

However, a number of arguments can be advanced that the management of price instability cannot be left to farmers to handle on their own:

- Agricultural prices do not necessarily behave efficiently. Wide variations in prices are partly endogenous and only partly due to exogenous shocks in supply or demand. As a result farmers may not make efficient investment decisions. This supports a role for public intervention to stabilise market prices.
- As argued above, the amplitude of price volatility is greater in agricultural markets than in non-agricultural markets. Furthermore, farmers tend to work on narrower margins than other sectors. In agriculture the income margin between returns and cash costs - intermediate consumption of inputs, depreciation, paid labour, interest and rents - is rather small (Vrolijk et al., 2009). This small margin also results in strong fluctuations in incomes, even with a relatively small change in prices. For instance, with a margin of 10% incomes will increase or decrease by 50% if product prices go up or go down by just 5%. The Commission has calculated that, on average, in each year between 1998 and 2003, one quarter (24%) of all EU-15 farms experienced a drop income greater than -30% (Commission, 2008b).
- Farmers' resilience to adverse price shocks may be inferior to enterprises in the non-farm sector, so that there is a stronger likelihood that an adverse shock will result in a significant decline in well-being. Arguably, market instability should not be a problem for market participants in the presence of well-functioning financial and credit markets. If credit institutions are confident in the long-term viability of a business, the business should be able to access finance to tide itself over periods of unusually low prices. However, the family farm structure of agriculture combined with credit market imperfections means that, in practice, farms are unable to smooth their adjustment to shocks in this way. However, some farm sectors, including pigs, fruits and vegetables, and wine have long lived with much greater volatility than is the norm for those sectors more heavily supported in the past.

## 2.2 Has volatility increased?

There is strong evidence using a variety of techniques that price volatility has been increasing on EU markets. Two measures of volatility are widely used (Commission 2009a):

- Historical (realised) volatility based on observed price movements of price over an historical period. Historical volatility reveals how volatile a price has been in the past and reflects the supply and demand conditions which determined those prices in that period.
- Implicit volatility, which is the markets' view on how volatile a price will be in the future. It represents the market's expectation of how much the price of a commodity is likely to move and tends to be more responsive to current market conditions.

Table 1 shows historical price volatility for six agricultural products in the EU, using German prices as an indicator. Volatility is calculated for three periods: 1983-92 representing the unreformed CAP; 1993-2004 which represents the 'MacSharry' CAP with coupled direct payments and WTO disciplines on border protection; and 2005-January 2010 representing the 'Fischler' CAP with decoupled direct payments and WTO disciplines on border protection. Sugar beet, for which there was a minimum guaranteed price throughout the period, exhibits the lowest level and no real trend in volatility. The V-shaped pattern for sunflower is also unique. But for the other four products, there is a clear trend towards increased price variability with successive CAP reforms.

It would be incorrect to attribute this increased volatility to the CAP reforms if, at the same time, world price volatility was increasing, but the second block of Table 1 does not support this conclusion. The point is brought out more strongly in the third block of Table 1 which shows the ratio of German to world price variability. Two points emerge from this comparison. First, EU price volatility consistently has smaller amplitude than world price volatility, and second, there is increasing convergence over time as EU price variability increases to match the world market experience.<sup>3</sup>

While EU volatility appears to be increasing, producers of different commodities experience it differently, and it also translates into different experiences with income fluctuations on different types of farms (see Bielza Diaz-Caneja et al. 2008). Vorlijk et al., 2009 highlighted the importance of the cost-return ratio in influencing income volatility. Because more specialised larger farms (often with salaried employees) have a smaller income margin than 'traditional family farms', larger farms with small margins experience a larger volatility in their incomes than the smaller farms. This helps to explain their counter-intuitive finding that the highest volatility of farm incomes is found in the north-western part of Europe. While output volatility is higher in the southern European countries and to a lesser extent in the Nordic countries given their greater exposure to climatic variability, this does not carry through to farm income which is much more volatile because it is a residual indicator.

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<sup>3</sup> For the 2005-10 period, wheat and maize price volatility in Germany was actually greater than on the world market. This period is dominated by the amplitude of the price spike in 2008 with no discernible trend, and the figures suggest that the spike in prices was actually greater in Germany than on world markets at that time. Similar findings to Table 1 were found by Keane and O'Connor (2009) and O'Connor et al. (2009) for dairy products.

**Table 1. Commodity market volatility in the EU**

	1983-1992	1993-2004	2005-2010
<i>Variability German prices</i>			
Common wheat	5.56	10.49	33.53
Maize	6.35	10.98	26.01
Sugarbeet	1.08	4.38	3.08
Cattle	4.53	7.89	4.85
Rapeseed	11.82	14.09	22.13
Sunflower	18.36	8.89	19.97
<i>Variability world prices</i>			
Common wheat	15.09	20.53	25.99
Maize	17.73	20.94	20.23
Sugar	30.17	19.49	27.68
Cattle	6.93	15.25	5.15
Rapeseed	24.14	21.19	25.34
Sunflower	15.91	21.08	42.73
<i>Ratio variability German to world prices</i>			
Common wheat	0.37	0.51	1.29
Maize	0.36	0.52	1.29
Sugarbeet/sugar	0.04	0.22	0.11
Cattle	0.65	0.52	0.94
Rapeseed	0.49	0.67	0.87
Sunflower	-	0.42	0.42

Source: Own calculations based on German monthly price data from ZMP and world price data from IMF Financial Statistics (beef, sugar, sunflower) and World Bank Commodity Pink Sheets (wheat, maize, cattle). Variability in each period is measured as the trend-corrected coefficient of variation following the approach of Cuddy and Della Valle (1978) where the trend (linear, log-linear or no trend) can differ between periods and between the German and world price data for the same period.

Cafiero et al. (2007) make the point that the likely increase in the variability of agricultural prices, in itself, does not necessarily imply riskier prospects for European farmers. This is because of the presence of a fixed income component in the form of the Single Farm Payment. They show that the variance of the production-related revenue after the reform can be sizably larger than before to compensate for the fact that now part of the total revenue is fixed. Thus, they reject the view that the CAP reform per se is a cause of increased economic risk for farmers. The Commission has calculated in that most Member States (except the UK and Ireland) the percentage of farms with negative income variations has fallen in the early 2000s compared to the early 1990s, and concluded that, as direct payments have increased, income stability has improved (Commisison, 2008b). Of course, if there is a reduction in the relative importance of the SFP as a component of farm income after 2013, this will raise the relative contribution of variability in the market-based revenue.

### 2.3 Prospects for future volatility

The future outlook for price volatility depends on how variable its determinants will be. Among the relevant determinants are:

- The global balance between supply and demand has tightened and global stocks for many commodities are at historically low levels.
- Climate change is expected to increase market volatility because of the greater frequency of extreme climatic events.
- Trade liberalisation traditionally was expected to contribute to greater price stability because of the 'elasticity' argument – higher price transmission elasticities connecting domestic and world markets as a result of lower trade barriers would help to overcome the traditional 'thinness' of world markets which has been an insidious source of price volatility. However, trade liberalisation is also accompanied by shifts in the location of agricultural production (from areas with more stable yields to areas with more variable yields) as well as by the running down of public stocks which contributed to global price stability in the past.
- Food markets are increasingly interlinked with energy markets, so volatility in energy markets will increasingly spill over into food markets. One particular energy-related policy which will contribute to greater food price volatility in future is the use of biofuel mandates expressed in volume terms. Such mandates effectively reduce the price elasticity of demand for agricultural feedstocks and exacerbate volatility in the relevant food markets.
- Imperfect price transmission along the food supply chain exacerbates volatility at the farmgate level. There is some evidence that retail pricing is become more 'sticky' and less competitive, and this will further pass the burden of adjusting to exogenous shocks back the food supply chain to the primary producer.

Evidence on implicit price volatilities confirms that market participants expect increased price volatility to persist in the near future. Implied volatility represents the market's expectation of how much the price of a commodity is likely to move in the future.<sup>4</sup> FAO has calculated trends in implied volatility for three commodities, wheat, maize and soybeans, for which options data are readily available (FAO, 2008). The FAO data underline how volatile these markets have become and how volatility has persisted over time. As of April 2008, implied volatility stood at around 40 percent for wheat and soybeans, and 30 percent for maize. These percentages are a measure of the deviation in the futures price (six months ahead) from underlying expected values. Under reasonable assumptions, they allow one to say that 'the market estimates with 68 percent certainty that prices will rise or fall by 40 percent for wheat and soybeans and 30 percent for maize'. FAO notes that implied volatility for wheat fell sharply in April 2008 from the previous month and was relatively stable for maize. It conjectures that this could signal that grain markets are entering a period of relative stability although implied volatility remains well above its historical levels (FAO, 2008). Of course, the views of market participants may not be well founded, and actual outcomes have surprised the markets in the past.

For EU farmers, the impact of world price volatility is mediated by the behaviour of exchange rates (in particular the USD-EUR exchange rate given that most agricultural commodities are traded in US

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<sup>4</sup> The implied volatility of an option contract is the volatility implied by the market price of the option based on an option pricing model. In other words, it is the volatility that, when used in a particular pricing model, yields a theoretical value for the option equal to the current market price of that option. Options, like any other financial instrument such as futures contracts, are priced based on the market estimates of future prices, as well as the uncertainty surrounding these estimates. The more divergent are traders' expectations about future prices, the higher the underlying uncertainty and hence the implied volatility of the underlying commodity.

dollars) as well as by the ease of price transmission across EU borders. The USD-EUR exchange rate experienced significant fluctuations during the 1990s, and this seems likely to continue. Further changes to CAP border policies (documented in the following section) mean that world market prices will be transmitted more strongly to the EU domestic market in the future.

Farmers' vulnerability in the face of price volatility may also be greater in the future. Greater specialisation as farmers seek production efficiencies through economies of scale and larger sector-specific investments may reduce their production flexibility in the face of relative price changes. Also, the income margin per unit of product is decreasing, partly because farm prices do not follow the general development of prices (inflation) (Vrolijk et al., 2009). There are thus good reasons to explain why market instability has become such a hot topic in the agricultural policy debate on the CAP post-2103.

## 3 Risk mitigation - market management instruments

### 3.1 EU market stabilisation policies

Although successive CAP reforms have greatly reduced the extent of market intervention, a range of market management measures remain available under the single Common Market Organisation (CMO) in force since 1 January 2008 (Council, 2007) and modified by the decisions taken as part of the CAP Health Check of November 2008 (Council, 2009). A review of these remaining measures is thus the starting point for consideration of price risk mitigation instruments.

**Intervention purchasing and withdrawals:** Public intervention now operates more as a safety net than a price support mechanism. Fixed-price purchases are applied only in the case of certain products (soft wheat, butter and milk powder) and to quantities determined in advance.<sup>5</sup> Beyond these quantities, the purchase price and quantities offered for intervention are established by the Commission under the tendering procedure. During the 2009 milk market crisis, for example, the Commission continued to purchase dairy products into intervention in quantities beyond the pre-determined ceilings under the tendering system at prices very close to the fixed intervention buying-in prices. Under certain conditions producer organisations in the fruit and vegetables sector may apply withdrawal measures. The common market organisation for wine provides producer organisations with the option of applying crisis distillation measures if the market is seriously unbalanced (Chatellier 2009).

**Aid for private storage (APS):** Depending on the state of the market, the Community authorities have the option of encouraging the private storage, through targeted aid, of the following products: butter, meat (beef and veal, goatmeat, pigmeat and sheepmeat), sugar and olive oil. The schemes are an alternative to public intervention in that the products remain the property of the storers to sell at their unrestricted discretion at the end of the storage period.

**Import levies** were transformed into bound import tariffs following the Uruguay Round Agreement on Agriculture (URAA) in 1994. Nonetheless, border protection continues to limit the transmission of

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<sup>5</sup> In the case of durum wheat, corn, barley, rice and sorghum, intervention quantities were reduced to zero, meaning that they could be reactivated, if need be, depending on the state of the market.

world price instability to EU markets. For some commodities, this is built into the post-URAA system of border protection (for example, the continuation of the 'entry price' system for fruits and vegetables). More generally, the EU makes widespread use of specific and mixed tariffs rather than ad valorem tariffs alone, which provide greater protection when world prices are low and less when they are high. Finally, the URAA only binds the maximum permitted tariff. In practice, the EU is free to adjust its applied tariffs within these bounds. For example, the EU lowered the applied tariff on cereals to zero during the 2007-08 price spike, thus ensuring that EU domestic prices increased less than the increase on world markets.

**Export refunds** were also disciplined by the URAA. The EU now has ceilings on the total value of expenditure on export subsidies and the maximum quantity of subsidised exports. Although expenditure on export subsidies has fallen sharply in line with the increased level of world prices, they remain important for individual commodities and potentially important if world prices were to fall again. The EU resorted to the re-introduction of export refunds for dairy products and pigmeat following the collapse in prices after the peak in mid-2008.

**Subsidies designed to promote internal consumption:** While processing aid for butter has been eliminated, two categories of processing aid (skimmed-milk powder for animal feed and skimmed milk made into casein or caseinate) are maintained. The EU has used expenditure for the promotion of consumption of certain products, such as dairy products, as a counter-cyclical measure.

In the coming period, the availability of some of these market management measures may be further restricted. A successful Doha Round WTO agreement would further reduce import tariffs and lead to the elimination of export subsidies after 2013. Indeed, there is some evidence that the EU may unilaterally forego the use of export subsidies in the post-2013 CAP. Lower ceilings on the permissible level of trade-distorting support may also require some changes to intervention mechanisms in order to ensure compliance. The question which is now being raised in the debate on CAP reform is whether new powers should be given to the Commission to manage markets and, if so, what they should be?

In fact, the Commission already has the legal basis for broader intervention measures. Article 186 of Regulation (EC) No 1234/2007 (establishing the single Common Market Organisation for agricultural products) entitled *Disturbances as regards internal market prices* provides that the Commission can take measures in cases of disturbances of the market of certain agricultural products where internal market prices significantly rise or fall. Specifically, the Commission is now authorised to take the necessary measures (a) with regard to the products of the sugar, hops, beef and veal and sheepmeat and goatmeat sectors, where the prices on the Community market for any of those products rise or fall significantly; (b) with regard to the products of the pigmeat, eggs and poultrymeat sectors and, with regard to olive oil, where the prices on the Community market for any of those products rise significantly. Originally, milk and milk products were not covered by that Article but this was altered in 2009 extending the Commission's powers to react to market disturbances in the milk market.

In addition to this general authority to take exceptional measures, the single CMO includes provisions for special interventions under particular circumstances and in particular sectors. For example, the Commission may adopt exceptional support measures in response to animal health restrictions in export markets, or where there is a sudden loss of market confidence in the eggs and

poultry sectors. Special measures in the cereals sector can be taken if, in one or more regions of the Community, market prices fall, or threaten to fall, in relation to the intervention price.

Thus the Commission has considerable legal powers to propose the extension of safety net measures. Its main fear, of course, is that easy resort to the use of these measures could lead to the re-emergence of intervention as a regular market outlet. There is no longer provision in the CAP budget for major increased expenditure on market management measures, as we saw in the 2009 dairy crisis. There is also the difficulty that any intervention purchases (even in the absence of a fixed intervention price) would count against the EU's ceiling for trade-distorting support in the WTO. The justification for this discipline is to prevent the EU pursuing a domestic policy objective of increased price stabilisation at the expense of destabilising world prices to the detriment of the rest of the world. This is an important public good from which the EU also benefits given that the same disciplines apply to its trading partners and competitors. We discuss in a subsequent section whether there is a case for relaxing this WTO discipline in the context of an international agreement on stock-holding policies.

### 3.2 Contractualisation

Forward contracting has always played a role in helping individual producers to manage price risk, and in principle belongs in the next section on risk transfer measures. However, the term 'contractualisation' (taken from the French) is used here to suggest the use of collective agreements between suppliers and processors to manage prices. The idea has received particular attention in the dairy sector, partly because of the 2009 milk price crisis but also because of the imminent phasing out of milk quotas after 2015. Since 1984, milk quantities have been fixed by quota while before that date excess quantities of dairy products were sold into intervention. The end of quotas will leave milk processors in unfamiliar territory in requiring them to manage fluctuating milk volumes in a relatively free market. There is a fear that small changes in milk volumes could lead to much greater price instability in the new environment, although the important role of export markets in EU dairy sales should provide a stabilising influence by increasing the elasticity of the demand curve facing processors.

The Commission established a High Level Expert Group on Milk to discuss medium and long-term arrangements for the dairy sector given the expiry of milk quotas on 1 April 2015 with a brief, *inter alia*, to examine contractual relations between milk producers and dairies to better balance supply and demand on the dairy market. Some milk producer groups have called for the retention of supply control measures to manage the market but this has been rejected so far by the Commission. Strengthened contractual relations between private parties have been proposed as an alternative way of ensuring minimum prices.

Long term contracts that specified a delivery and purchase commitment as well as setting a basic price that could subsequently be adjusted in the light of actual processor revenue have been widespread in the dairy industry. However, these arrangements have come under increasing pressure as long-term relationships have been eroded and producers have sought shorter contract

periods. Faced with greater market price volatility, longer-term contracts with appropriate risk-sharing arrangements may become more popular again.

More problematic is the notion apparently favoured by France which has suggested setting a minimum price for milk at national level between producers and industry. Indeed the French view is that such 'contractualisation' at EU level between producers of agricultural commodities and industry could be proposed for other farm commodities too. Such collective price fixing appears incompatible with EU competition law and impossible to manage in a dynamic market. A Franco-German memorandum supported by 16 Member States in September 2009 included a more modest proposal to examine how the arrangements for producer groups in the wine and fruits and vegetables sectors might be extended to the dairy sector.<sup>6</sup> Few details have emerged to date on how these contractual arrangements would work in practice – the High Level Group will hold a meeting in Brussels on 26 March 2010 to make a presentation on its work to date, and its final report is expected by June 2010.

### 3.3 International commodity stabilisation policies

The experience of the 2007-08 price spike revealed weaknesses in the architecture of global food trade governance (Christiaensen, 2009). WTO regulations are largely geared towards the challenges faced by exporters and thus focused on import restrictions, such as high border protection, domestic support, and export subsidies. The use of quantitative restrictions and embargoes on agricultural exports is permitted to relieve shortages of 'basic foodstuffs or other materials of importance to the exporting country'. And, the requirement in the WTO Agreement on Agriculture that such restrictions must be notified has been notably ineffective (Mitra and Josling, 2009). Meanwhile, there are no disciplines on export taxes. This asymmetry of treatment contributes to greater global price volatility (by increasing the likelihood of high world food prices) as was demonstrated by the behaviour of exporters, particularly of rice, in the 2007-08 food crisis. The EU should work for more stable world markets through seeking stronger disciplines on export restrictions and export taxes. This is an important topic for the Doha Round, though not very high on the agenda so far. The use of biofuel mandates fixed in volume terms could also be reviewed with a view to making them more responsive to the state of world food markets.

Fundamentally, however, in the absence of stocks, fluctuations in world prices simply reflect the global supply and demand position for individual commodities at different points in time. If the world as a whole wants more stable international prices, then it needs some mechanism to ensure that stocks are built up during periods of low prices and released during high-price periods. Attempts to regulate international commodity markets have a long history, going back to the 1930s. However, relatively few ICAs with economic provisions were established, even at the high-water mark of commodity power during the 1970s. The 1974 World Food Conference in Rome discussed the establishment and management of an international reserve stock to stabilise grain markets. The 1976 meeting of the UNCTAD in Nairobi proposed to establish an Integrated Program for Commodities (IPC), with subsequent international commodity agreements with the purpose of

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<sup>6</sup> See the Franco-German initiative on milk prices in September 2009 which was supported by 16 EU Member States, <http://register.consilium.europa.eu/pdf/en/09/st13/st13035.en09.pdf>.

stabilizing markets. In practice, international commodity arrangements (ICAs) have gradually suspended their historical objective of price stabilization. In the 1990's only two ICAs (on cocoa and natural rubber) included provisions for price stabilization and the newest agreements (coffee, sugar and grains) were considered to be of mere administrative nature. The declaration of the recent high level Conference on World Food Security hosted by FAO in June 2008 mentions price volatility only in the context of pleading for the avoidance of restrictive trade measures that could increase price volatility and, additionally, it makes a general call "to undertake initiatives to moderate unusual fluctuations of the food grain prices" in the context of strengthening food security (OECD, 2009).

The demise of ICAs occurred for both technical and political reasons. ICAs tried to influence market prices through stocking schemes, supply management through export quotas, or multilateral contracts involving mandatory price ranges. Regardless of the instrument used, all ICAs face the problem of deciding the price range they want to defend. If set too high, the cost of defending the price floor will become prohibitive; if set too low, the scheme provides no real benefit to producing countries. There was also confusion over whether scheme objectives were simply to stabilize prices or to try to raise them above the declining trend. Apart from the tin agreement which collapsed when the buffer stock manager ran out of funds to support the market, other ICAs have simply lapsed. Either insufficient funds were available to the commodity authority to intervene effectively in the market, or exporting countries had difficulty in agreeing on the distribution of export quotas among themselves.

Recently, Von Braun et al. (2009) have proposed an internationally coordinated strategic reserve system for foodgrains. They propose that there should be an agreement under the auspices of the United Nations that each participating member country would hold a certain amount of public grain reserve in addition to the pipeline stock that the private sector holds for commercial operations. Although the exact amount of public reserve that each country holds would be subject to further study, it would not be too large as a percentage of its annual domestic grain demand. These reserves would be drawn upon by a high-level technical commission when needed for intervention in the spot market. The authors recognise that past experience has not been promising and the challenge of multilateral coordination and determination of optimal operation procedures should not be underestimated. Nonetheless, the attempt to establish decentralised but internationally-coordinated stocks rather than centrally-managed buffer stocks may help to improve the prospects for success.

One could envisage EU safety-net intervention operating as part of such a system of internationally-coordinated stocks or even unilaterally in a way that contributes to global price stability. EU intervention policy got itself a bad name in the past, in part because it operated in a pro-cyclical rather than counter-cyclical way with respect to the world market. This was because it operated behind high tariff protection, so that the benefits of intervention were confined to EU producers rather than being a contribution to world price stability. EU tariffs are now much lower than they were before. Therefore there is a higher probability that the removal of product from the EU market would lift prices not only for EU suppliers but also for suppliers outside the EU. Such globally beneficial stock-holding should be encouraged by WTO rules, but this would require a rewriting of the Uruguay Round disciplines on public stock-holding policies.

## 4 Risk transfer – market-based risk management instruments

Even with smart interventions in international commodity markets, farmers will experience more price volatility in the future than they have in the past. While some fear that the dismantling of the CAP will leave producers very exposed to price risks, we should underline that the existence and availability of price support has been partly responsible for the underdevelopment of market-based alternatives. The most important reason for the limited use of market-based risk management products for agricultural price risk management by farmers and processors is the security that has been provided by CAP and the inbred expectation that the consequences of price volatility will be borne by the taxpayers. By ensuring stable farm prices, the CAP has meant that producers have had little or no incentive to resort to market-based price risk management instruments.

Market-based risk transfer instruments such as over the counter (OTC) contracts, futures and other derivatives offer the best way for farmers to cope with high price volatility and market uncertainty. Futures markets play an important role in price discovery as well as allowing producers and processors to hedge their price risk. The use of futures markets in Europe has traditionally been lower than elsewhere, in part because of the effectiveness of public risk management interventions. However, there is now considerable evidence of innovation in this area. Alizadeh and Nomikos (2005) argue that the derivative contracts offered by European Exchanges provide a fairly effective method for agricultural price risk management, and European producers can get the same level of risk protection as can the US farmers, using the “more established” US derivatives markets.

The main agricultural contracts traded are on Euronext in London (cocoa, coffee, sugar, feed wheat) and Paris (milling wheat, rapeseed, maize). There are also futures markets in Germany (for hogs, piglets, potatoes) and in Spain (for olive oil). Moreover, there have been considerable efforts to develop new agricultural futures and options markets. Bielza Diaz-Caneja et al. (2008) report that at least four new commodity exchanges that offer futures and options based on agricultural commodities have been established since 1988. They instance the Blagovna Borza maize and barley futures of Ljubljana (Slovenia); the cereals, sunflower, beans, timber, rice and sugar futures in the Sofia Commodity Exchange (Bulgaria); the maize, wheat and sunflower options and futures contracts and feed barley futures contracts in the Budapest Commodity Exchange (Hungary), since 1989; the wheat and cotton futures exchanges in Turkey (since 2005). They calculate that at least 38 new agricultural futures and options contracts have recently been launched, including futures and/or options for wheat, maize, live hogs, rapeseed, rapeseed meal and rapeseed oil. Recently a number of parties have expressed interest in launching dairy futures in the EU (LIFFE, EUMIX, Rabobank). While many of the new European agricultural futures and options markets are not actively traded, the pace of innovation in this area is such that a range of hedging possibilities is now opening up for European farmers.

Futures markets have a number of drawbacks which may limit participation. Basis risks and trading costs can be a serious obstacle to farmer participation.<sup>7</sup> Markets may not be available for all

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<sup>7</sup> Basis is the difference between the spot price of the hedged asset and the futures price of the contract while basis risk is the risk that the change in price of a hedge may not match the change in price of the asset it hedges (Keane and O'Connor, 2009).

commodities although we saw earlier that this is an area currently undergoing dynamic change. The quantities specified in the contracts may be large relative to the scale of many producers, although collective action either through processors or financial intermediaries such as brokers can help to overcome this problem. Perhaps the biggest obstacle to participation is the novelty of futures markets and derivatives and lack of understanding due to inadequate information and training, and this is also where public policy has a role to play.

Because futures and derivatives markets are market-based, there is a limited if important role for public policy. The EU can promote their development by ensuring an appropriate and effective regulatory and supervision environment; by ensuring the availability of high quality, timely and reliable market information; and by encouraging and supporting training and education in the use of these risk management tools. In some countries governments have lowered transactions costs by providing subsidies towards the cost of futures contracts. The EU also needs to be aware that the willingness of farmers to avail of these hedging instruments will also be influenced by its decisions regarding the availability of public safety net instruments.

## **5 Risk coping - addressing income stability**

If the EU is unable to dampen price instability through market management instruments, and farmers cannot transfer this risk through the use of market-based risk management instruments, then there is a consequential risk of income instability. A sharp price decline for one or more major agricultural commodities could lead to considerable income distress among farm families. This could lead to demands for government intervention to help farm families cope with this instability. A sharp drop in income could also be due to production risks of various kinds, such as floods or an animal disease outbreak, so ex post government measures to mitigate the effect of losses suffered by farmers, by financial transfers or other provisions intended at facilitating economic recovery, are usually not targeted at price instability alone. Such measures are fundamentally redistributive policies that spread the losses over the general population through the public budget. We examine the options in this section.

Stabilising farm revenue or income is in principle a less onerous task than stabilising prices. Because revenues are calculated at a higher level of aggregation than for individual commodities, whole farm revenue instability will be less than price instability given that price movements of individual commodities are not perfectly correlated. Prices and yields may also be negatively correlated which will contribute to the stability of their product. The same will hold if non-farm incomes and policy transfers are negatively correlated with farm market revenue. Nonetheless, despite the operation of these 'automatic stabilisers' revenue and particularly income instability is a common experience of farm households.

### **5.1 Direct payments and income stability**

In the Commission's view, income stabilisation is now largely provided by the new system of decoupled payments (Commission, 2005a). Direct payments (through the Single Farm Payment

(SFP), less favoured area payments and agri-environment payments) now make up a substantial part of farm incomes, although their relative importance varies across countries, across different farm systems and across farms, particularly where countries have opted for the historic model of payment. As already noted, Cafiero et al. (2007) showed that the conversion of even a small proportion of farm revenue into a (fixed) direct payment would stabilise income flows over time, even if the volatility of the residual market-based revenue increased. The Commission noted the reduction in income volatility on EU farms between the early 2000s compared to the early 1990s and attributed this to the introduction of direct payments (Commission, 2008b).

The drawback with the current Single Farm Payment is that it currently lacks legitimacy, and there is a strong likelihood that the value of these payments, and thus the contribution they make to revenue and income stability will be reduced in the post-2013 CAP scenario. While a reduction in SPF entitlements could be offset by a corresponding increase in payments for public goods, the overall budget available for CAP payments may well come under pressure in the negotiations on the next Financial Perspective. The SFP is also criticised because farmers continue to receive these payments (as in 2007) even when market prices and revenues are high. This criticism is misguided if the purpose of the payment is to ensure environmental cross-compliance; it is precisely when farm commodity prices are buoyant that governments need to increase the price they pay for 'environmental services'. However, the validity of this defence is undermined by the lack of a clear relationship between the SFP and environmental objectives. We should also note the use made by the EU of some flexibility in payment dates during the milk crisis in 2008-09 (albeit this flexibility is very limited and confined to a couple of months at best under the EU's annual budget rule). Advance payment of the SFP in difficult years can help to offset cash flow problems on farms facing an income crisis.

## 5.2 A countercyclical SPS?

An apparently simple way to make the Single Payment Scheme counter-cyclical would be to turn it into a multi-annual programme. In other words, given the funding allocated to the scheme under the next Financial Perspective 2014-2020, the Commission and Member States could be given some leeway in the rhythm at which payments were made, presumably related to income developments either at the EU or Member State level. But the difficulties are obvious. The scheme would not be eligible for the Green Box under WTO rules so payments would count against the EU's ceiling on trade-distorting support. Detailed rules would have to be drawn up on the circumstances which would trigger accelerated or delayed payments. If the Commission and Member States guess the trend evolution of farm incomes wrongly, there is a risk that the overall budget would be exhausted before the Financial Perspective expired. And, in the end, it is not clear what the advantage is for the public sector to undertake this stabilisation role. Given that a farmer would know his direct payment entitlements under the Financial Perspective, he should be able to use the normal financial markets to borrow on the strength of these payments to make up an income gap during a particularly bad year (Bureau and Witzke, 2010).

Alternatively, the rules could be set and the EU could agree to find the budget resources to meet the commitments implied by these rules in any year. US experience suggests that counter-cyclical

guarantees would lead to dramatic changes in farm expenditure from one year to the next (Bureau and Witzke, 2010). This would be totally incompatible with the current rigid appropriations in the EU budget and would require a revision of EU budget procedures to make it possible.

An alternative would be to turn the SPS into a revenue-deficiency payment scheme along the lines of similar schemes introduced in North America. An example is the US Average Crop Revenue Election (ACRE) programme suite which was introduced in the Food, Conservation and Energy Act of 2008 (the 2008 Farm Bill).<sup>8</sup> US farm programmes provide three types of support: fixed direct payments, marketing loan and counter-cyclical payments. The direct payment programme pays farmers a specific dollar amount per historical base acre. The dollar amount does not change with market prices or with the level of production. Marketing loan and counter-cyclical support rates provide a floor on the per unit value of the crop. Payments occur if market price drops below the support rates. Marketing loan payments are based on current production and prices, while counter-cyclical payments are based on current prices but historical production.

The 2008 Farm Bill provides farm commodity programme participants with the choice of continuing with the traditional suite of direct payment, marketing loan, and price counter-cyclical programmes or electing for the new ACRE programme suite. The ACRE suite, which was authorized for the 2009-2012 crop years, means that the farmer would continue to receive 80 percent of his normal direct payments, be eligible for marketing loans at 70 percent of the loan rate, and be entitled to participate in a new state revenue programme. Thus, the revenue programme replaces the counter-cyclical programme and substitutes for lower direct payments and loan rates. The target of the new programme is revenue, not price. The revenue target is not fixed, but changes with US prices and state yields. A farm level revenue loss for an eligible crop must be met for a farm to receive an ACRE payment, and it is partially coordinated with crop insurance. We consider the Commission's income safety net proposal, which has some similar features to the ACRE programme, in the subsequent section on crisis management.

### 5.3 Revenue or Income insurance

Given the uncertainty about the future of direct payments, the Commission and a number of Member State governments have investigated alternative instruments to address income instability, including insurance (see Commission, 2001; Commission, 2005a). Much of the interest in insurance schemes in recent years, both in the United States and in Europe, is arguably due to the inclusion of two measures in the WTO Green Box, government financial participation in income insurance programmes or income safety nets, and payments for relief from natural disaster. The eligibility criteria listed in the URAA state that compensation of up to 70% is allowed for income losses of at least 30% of the preceding three years' average (articles 7 and 8 of Annex II).

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<sup>8</sup> Other revenue-deficiency programmes include the Supplemental Revenue Assistance programme, the Milk Income Loss Contract programme and the Livestock Gross Margin for Dairy Cattle Insurance Policy, see Keane and O'Connor (2009) for an explanation of the latter two.

The CAP Health Check in November 2008 allowed Member States to redistribute some of the direct support granted under the first pillar of the CAP to the development of risk management measures. Member States can now make a financial contribution to crop, animal and plant insurance premiums against economic losses caused by adverse climatic events and animal or plant diseases or pest infestation and by way of mutual funds for animal and plant diseases and environmental incidents. In line with the WTO's requirements relating to the payment of domestic support for agriculture, this financial contribution can be made only if the production losses incurred over the year are 30% higher than a historic reference figure calculated over three years. The insurance indemnities, which are paid directly to farmers, must, in no circumstances, exceed the loss amount reported. A maximum 65% of the insurance premium can be financed by public funds, with the remainder payable by the farmer. Member States' expenditure will be co-financed by the Community at a rate of 75%. Four Member States (France, Italy, Greece and Belgium) have notified €350 million in subsidies in 2010 under these new provisions (Perrin et al., 2009).

The Health Check initiative only provides for production risk insurance. However, interest in revenue and income insurance has been growing, in part stimulated by the lessons from the US and Canada which began to develop different mechanisms of revenue insurance policies since the early 1990s. In 2002, about half of total US crop insurance premiums were spent in some form of revenue insurance (Mahul and Wright, 2003). The European Commission has commissioned several studies focusing on the broader topic of agricultural risks, among which revenue and income insurance policies have received special attention, and has motivated empirical work to examine various formulas of revenue and income insurance (Meuwissen et al., 1999; Bielza Diaz-Caneja et al., 2008).

In the United States, the USDA Risk Management Agency offers an area revenue insurance scheme known as the Group Risk Income Plan (GRIP) and a pilot whole-farm revenue plan known as Adjusted Gross Revenue (AGR) insurance. The GRIP program's payment mechanism is based on the availability of long time series of county yields and readily available futures prices for price discovery. The use of county yields rather than farm yields avoids cheating and moral hazard, but does so by also diminishing the correlation of actual losses from a producer's actual yield losses. Using more aggregate yields such as a state yield increases this form of basis risk. Historical county data are widely available for programme crops in major producing counties. However, for some regions and crops historical data are lacking, which constrains the availability of the GRIP programme. Similarly, GRIP uses futures markets for price discovery. The ability to replicate a similar programme in the EU might be constrained by the lack of comparable yield and futures markets data.

In contrast, the AGR scheme is based on adjusted tax returns. Assessment of a farmer's risk profile needs a baseline of expected farm revenues over at least five years, but this can be problematic, for example, where the size of farm changes or the farmer changes enterprise. Issues also arise where the farmer has non-farm enterprises. The measurement and validation of a claim requires a very significant accountancy input, much greater than for traditional yield insurance.

The Canadian Agricultural Income Stabilisation programme (CAIS) is based on whole farm net revenue like its predecessor, the Net Income Stabilisation Accounts (NISA). Both programmes represent forms of subsidised savings programmes rather than a pure insurance scheme. The NISA programme matched producer contributions to savings accounts, which provided funds for

withdrawal in low income years. CAIS matches withdrawals with relatively greater government contributions in low revenue years.

All observers agree that a revenue insurance scheme would not be possible without a significant level of public subvention. While in general insurance policies should only be used for stabilisation purposes, loss ratios in the neighbourhood of 1.5 to 2 (as in the US) are an indication that premiums are consistently lower than the paid indemnities, and thus insurance provides revenue support in addition to revenue stabilisation. It is argued that revenue insurance may be a more efficient alternative to direct payments in terms of revenue stabilisation, shifting the taxpayers' burden from the latter to subsidies for farmers' insurance premiums. Bureau and Witzke (2010) express their doubts, pointing out that evaluations of US insurance schemes stress their low transfer efficiency when one compares the cost paid by the taxpayer to the payments received by farmers. They argue that, for a constant budget, it is difficult to imagine that farmers would be better off spending that budget on subsidising insurance rather than direct payments. In their view, it is hard to picture any leverage or multiplier effect that would offset the rents and leakages associated with the management of insurance schemes. Antón and Giner (2005) compare the income and risk reduction impacts of insurance subsidies and fixed area payments. They find that area payments are more income transfer efficient, while insurance subsidies are more effective in reducing income variability. However, total farmers' welfare is found to benefit more from area payments than from insurance subsidies. A further issue is that revenue insurance, because it includes the risks of market instability, would not qualify for the WTO Green Box although income insurance, appropriately designed, would.

## 5.4 Crisis management

The Commission defines a crisis as an unforeseen situation that endangers the viability of agricultural holdings, either at a localised level, across a whole sector of production or at a wider geographical level (Commission, 2005b). Crises can be due to natural disasters, pests and diseases, as well as economic (conjunctural) factors or the closure of market access. The EU has created the European Union Solidarity Fund to assist Member States in the event of major natural disasters although it does not make payments to individuals. The EU Veterinary Fund has been created to provide financial support to farmers adversely affected by measures taken to control and eradicate epizootic diseases in livestock. Member States can also intervene with emergency aid (for a comprehensive list of national practices, see Bielza Diaz-Caneja et al., 2008). The Commission has the role of assessing these state aids to ensure that they do not distort competition. The current Commission guidelines for state aids in the agricultural sector permit aids under the risk and crisis management heading only for (a) damage caused by natural disasters or exceptional occurrences; (b) losses caused by adverse weather conditions; (c) to combat animal and plant diseases, and (d) insurance premia. The rules were recently amended to introduce a *de minimis* threshold below which state aids do not have to be notified to the Commission. These allow a maximum of €7,500 per farmer to be paid over any three-year period, provided that the total amount of *de minimis* aid granted to all farming enterprises in a Member State over three years remains below a ceiling of about 0.3% of the value of its total agricultural output.

During the 2009 milk market crisis, the Council adopted a proposal to allow for a temporary state aid of €15,000 to farmers through a modification of the Temporary Crisis Framework. The Temporary Framework for State Aid supports access to finance for enterprises facing increased difficulties to obtain credit as a consequence of the financial crisis. When originally introduced, it excluded primary producers. This was subsequently amended, although a lower ceiling for aid of €15,000 was introduced in order to avoid distortion of competition in the agricultural sector. This aid is available to all producers, not just dairy.

The Commission has investigated the possibility of a general income safety net for all farmers, based on principles compatible with WTO rules (Commission, 2008b). Under this option farmers would be compensated for a serious fall in income caused by whatever reason, defined as a negative variation of -30%. To remain within WTO rules, the amount of such payments should not exceed 70% of the producer's income loss in the year, defined as the difference between the current year income and the average for the three previous years.

This measure would require agreement on a precise, accounting definition of income, the use of a consistent accounting system and the availability of farm accounts in all Member States. It would be open to moral hazard, as a producer facing an income decline of, say, 25%, would be tempted to behave in such a way as to bring him inside the eligibility threshold. The budget cost would be high and, as important, uncertain. The Commission calculated that, based on the six-year period 1998-2003 for the EU-15 alone (in the absence of FADN data from the new Member States over a sufficient time period), compensation would have amounted, on average, to nearly €9.3 billion per year, varying between a minimum of €8 billion to a maximum of about €12 billion (Commission, 2008b). Also important, the distribution of payments between Member States would now be a function of income variability, and this would result in a very different pattern of Member State transfers than under either Pillar 1 or Pillar 2 at present. There would also be a totally different pattern of transfers between across farm sectors if potentially volatile sectors with historically low levels of support such as pigmeat were included. The link between payments and environmental cross-compliance would be lost. It would thus represent a totally different orientation for public transfers to agriculture than the current SFP.

Nonetheless, if there really is a desire to address the adverse effects of income volatility for farm household as opposed to the level of farm income, a scheme of this kind deserves further consideration. The total cost is considerably less than the current cost of the Single Farm Payment. It could be further reduced by excluding sectors which have historically not received market support under the CAP and by requiring some contribution from farmers which might increase over time as experience was gained, thus moving it closer to an income insurance scheme. Farmers' contributions could be linked to the proportion of their farm income that they wanted to insure. For example, farmers with already well-diversified income sources through off-farm employment or property income could decide to reduce their commitment or opt out of the scheme (though if there was a substantial public subsidy involved, it would not be expected that many would do so). The moral hazard issue could be addressed by some form of progressive scaling of compensation to avoid abrupt thresholds. It might be possible to allow for a variety of well-specified accountancy systems, because what matters is not the total level of reported income but rather the variability of that total compared to a (similarly-calculated) total from the past.

Some issues would remain. The variability of payments from year to year would still pose problems for the current structure of the EU budget. As an option, it could be considered to revise Article 69 to allow a Member State to opt to use its SFP entitlement for such an income safety net scheme, while leaving the Member State's budget to bear the risk of cost fluctuations. While national payments to an income safety net scheme would have to be notified to the Commission as state aid, the fact that such payments are already notified to the WTO as non- or minimally-trade-distorting payments should mean that no objection would be raised.<sup>9</sup> Indeed, it is possible to envisage that Member States would be allowed to provide such an income safety net even without EU financial participation, but this may be a step too far away from the single market for some to go.

## 6. Conclusions

Changes in global market conditions as well as the gradual dismantling of the traditional market management instruments of the CAP mean that EU farmers will experience greater price and income volatility in the future. This has led to an increasing number of calls for “strengthened safety net measures” and “greater public support for risk management instruments” in the CAP post-2013. This paper has reviewed the options for possible CAP interventions to address greater price and income volatility. In this concluding section, we outline some principles and guidelines for the way forward.

A fundamental question is whether increased price and income volatility represents a market failure which the EU or Member States should seek to address. The efficiency argument for intervention is that complete price risk markets do not exist. However, modern welfare analysis highlights that stabilisation entails both costs and benefits and net benefits are not guaranteed. An important consideration is that public policies will always crowd out private risk management instruments. Also, governments rarely know the 'right' market price. Calls for intervention following a sharp decline in prices may simply slow the necessary adjustment to a permanently lower market price environment. These considerations suggest that the primary role for public policy should be to increase the risk management ability of farmers, and more direct interventions should be kept as a last resort.

In retrospect, the 2009 milk market crisis was the first test of the EU's ability to address a price and income crisis with its more limited toolbox, although even in this crisis it was still able to resort to measures such as the reintroduction of export subsidies which may not be available in future. The important lesson from the crisis was not the capacity of the public authorities to respond, but rather the total lack of preparedness of farmers and the supply chain for this market outcome. It is to be hoped that, were this crisis to be repeated in ten year's time, farmers and the supply chain would be protected by much greater use of market-based risk hedging instruments.

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<sup>9</sup> This would require a revision of the current Commission guidelines on state aid which state that “...unilateral State aid measures which are simply intended to improve the financial situation of producers but which in no way contribute to the development of the sector ... are considered to constitute operating aids which are incompatible with the common market.” (Commission, 2006, Article 15). Because state aids are discretionary and to avoid distortions in competition, the current guidelines also require some producer contribution to mitigate this risk.

There is some scope for sensible public interventions which do not simply stabilise prices for EU producers at the expense of destabilising prices for the rest of the world. At the global level, the governance of world food trade remains a work in progress. The EU should press for modifications to the Uruguay Round disciplines, for example, to extend their scope to export taxes and restrictions, to eliminate the use of export subsidies, to require all import tariffs to be stated in ad valorem terms, and to provide for public stockholding where it contributes to the stabilisation of world prices. Greater flexibility in biofuel mandates, such that they become more sensitive to the state of world food markets, should also be considered. Such steps would help to offset some of the increase in world price volatility arising from the expected impact of climate change.

Within the EU, safety net intervention continues to exist for some products and the disturbance clause in the single CMO provides the opportunity for the Commission to take additional measures in exceptional market circumstances. The availability of these measures will be limited more by budget resources than any lack of legal powers. Aids for private storage rather than direct buying-in for public intervention may prove to be a more cost-effective form of intervention in the future. However, such intervention should not simply shift the risks of instability from EU to world markets. But if intervention buying measures, in effect, also support global prices and not just EU prices, their effectiveness in stabilising EU prices (that is, the amount of stabilisation obtained per €1 million expenditure) will be greatly reduced except in those markets with natural protection or where the EU is a major player. Market price instability is therefore a risk that EU producers must learn to live with in the future.

Risk transfer instruments such as futures markets will play an increasingly important role in hedging price risk. These are private market instruments but the EU can encourage their operation by an appropriate supervision regime, ensuring the timely availability of reliable market information and by providing training and education to farmers and other market participants.

Direct payments now contribute importantly to income stability. However, the future of direct payments is uncertain both in terms of their form and the budget that will be available. If expenditure on the SFP were simply shifted to expenditure on public good payments, then their stabilising effect would be unaffected, although exposure to price risk might be replaced by the institutional risk that national governments would be unable to come up with the counterpart funds to draw down their shares of the EU budget if co-financing is required.

Assuming that the part of the CAP budget for income support is fixed, then the question is whether it would make more sense to spend this budget on fixed payments or in ways which would stabilise income over time. This is ultimately a political choice on the relative importance of the stability objective. We saw above that the two options would imply very different eligibility criteria and thus radically different distributions of transfers between farmers and between Member States. The two alternatives to address the stability objective are public subsidies for income insurance or an income safety net which, in both cases, would have to comply with certain criteria in order to be eligible for the WTO Green Box.

The attraction of the insurance option is that the costs are relatively stable over time (although if public reinsurance were required then this would transfer some of the risk of variable payouts back to the EU budget). Insurance would also be a voluntary choice by farmers whereas an EU-run income safety net scheme would be likely to cover all eligible farmers. However, if the safety net option required some producer contribution and opting out was allowed, the difference between the two options on this point would be narrowed significantly. Other arguments also favour the insurance option. In the Health Check, Member States were given the option of contributing towards insurance premia, with EU financial participation, so it would be a relatively straightforward matter to enlarge the permitted range of insurance products to include income insurance to cover against market as well as production risks. Leaving Member States with the responsibility to address income instability also seems appropriate in the light of the subsidiarity principle. However, some financial participation by the EU as with the existing insurance subsidy options would continue.

Much work would be required on the technical design of income insurance products to address the well-known problems of moral hazard, adverse selection and systemic risk. A considerable amount of experimentation and preparatory work would be needed to determine the level of subsidy that would be required to make private income insurance viable. Leaving this to Member States to pursue would also seem to be the ideal arrangement to encourage this experimentation.

However, the industry needs to be aware that any extension of public safety nets will reduce the incentive for farmers, processors and other stakeholders to manage their own risks effectively, whether through risk diversification or risk transfer through the use of derivative markets.

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