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POLICY DEPARTMENT B
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COMPARATIVE ANALYSIS OF RISK MANAGEMENT TOOLS SUPPORTED BY THE 2014 FARM BILL AND THE CAP 2014-2020

STUDY

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AGRICULTURE AND RURAL DEVELOPMENT

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This document was requested by the European Parliament's Committee on Agriculture and Rural Development.

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Abstract

The 2014 Farm Bill includes risk management tools as an integral component of national agricultural policy whereas the CAP 2014-2020 seems to include them as an afterthought. While EU principles are sound, policies remain in limbo. They suffer from a double dichotomy: two CAP pillars and two administrative levels for implementation.
Ten recommendations are proposed for transforming the current state of limbo for EU agricultural risk management policy into a coherent CAP linked to world markets. They cover (1) EU coordination between public safety nets and private risk management tools, (2) flexible funding with improved reserve funds and precautionary savings, and (3) field tests to take full advantage of the creativity of private-public partnerships and to create an experience curve.

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LIST OF ABBREVIATIONS

ACRE Average Crop Revenue Election

AGR Adjusted Gross Revenue

AGR-L Adjusted Gross Revenue-Lite

AMS Aggregate Measures of Support

APH Actual Production History

ARC Agricultural Risk Coverage

ARP Area Revenue Protection

ARPA Agricultural Risk Protection Act

AYP Area Yield Protection

BPS Basic Payment Scheme

CAIS Canadian Agricultural Income Stabilization Program

CAP Common Agricultural Policy

CAT Catastrophic coverage policy

CBO Congressional Budget Office

CCP Commodity Futures Trading Commission

CCIP Common Crop Insurance Policy

CEIGRAM Centro de Estudios e Investigacion para la Gestion de Riesgos Agrarios y Medioambientales

CFTC Commodity Futures Trading Commission

CME Chicago Mercantile Exchange

CMO Common Market Organization

DAP Disaster Assistance Program

DMPP	Dairy Margin Protection Program (DMPP or MPP)
DP	Direct Payments
EAFRD	European Agricultural Fund for Rural Development
EAGF	European Agricultural Guarantee Fund
EMIR	European Market Infrastructure Regulation
ENESA	Entidad Estatal de Seguros Agrarios
ESMA	European Securities and Markets Authority
FAPAR	Fraction of Absorbed Phtosynthetically Active Radiation
FNGA	Fonds National de Garantie Agricole
FCIC	Federal Crop Insurance Corporation
FCover	Fraction of green leaf Cover
FMSE	Fonds national de Mutualisation Sanitaire et Environnementale
GEMI	Global Environment Monitoring Index
GRIP	Group Risk Income Protection
JRC	Joint Research Center
IRMA	Institute for Risk Management in Agriculture
IRS	Internal Revenue Service
IST	Income Stabilisation Tool
MAD	Market Abuse Directive
MiFID2	Markets in Financial Instruments Directive 2
MF	Mutual Fund
MFF	Multiannual Financial Framework
MS	Member State
NAP	Noninsured Crop Assistance Program

NAAFP	National Association of Agricultural and Food Policy
NASS	National Agriculture Statistics Service
NCPE	National Coalition for Producer Education
NDVI	Normalized Difference Vegetation Index
OTC	Over-The-Counter Market
PLC	Price Loss Coverage
RA	Revenue Assurance
RMA	Risk Management Agency
RP	Revenue Protection
RP-HPE	Revenue Protection with Harvest Price Exclusion
SCO	Supplemental Coverage Option
SPS	Single Payment Scheme
STAX	Stacked Income Protection Plan
SURE	Supplemental Revenue Assistance Program
VaR	Value-at-Risk
YP	Yield Protection

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EXECUTIVE SUMMARY

Farm Bill 2014 and CAP 2014-2020

Both the 2014 Farm Bill and the CAP 2014-2020 saw their genesis at nearly the same time. Public Law n° 113-79, referred commonly as the **"2014 Farm Bill" was signed by President Obama in February 2014** after a long process of negotiation between the House of Representatives and the Senate. The 2008 Farm Bill was to have lasted up to 2012. The 2014 Farm Bill is set to run for the period 2014-2018. In the European Union, a political agreement on the reform of the CAP was reached between the Parliament, the Commission and the Council in June 2013. **Four Basic Regulations (N° 1305, 1306, 1307 and 1308/2013) were then published in December 2013 (which have subsequently been completed by delegated and implementing acts in 2014)** dealing with direct payments, common organization of agricultural markets and rural development.

The US and EU Agricultural laws both deal with farm income level and variability with different tools and methods reflecting their respective agricultural sectors, history of agricultural policy and differentiated political vision of farm risk management.

Risk Management Tools and Safety Nets

Risk management is crucial at the micro-level (farms) and at the macro-level (national). It is a fundamental issue for farmers as, apart from bankruptcy which is the ultimate consequence of catastrophic events, variability of income and risks of income loss lead first to sub-optimal production decisions every year and second to sub-optimal investment decisions. The result is a reduction of farm competitiveness through short-term loss of productivity and long-term loss of innovation. At the macro-level, errors in collective risk management have adverse effects on value creation in the agricultural sector and may even affect the adequate regional food supply.

The US has historically supported farm income through *deficiency payment* type instruments that tend to stabilize farm income while leaving markets to their "*natural*" variability. Farmers were responsible for managing price risks on futures and OTC markets along with safety nets. In a completely different way, the initial CAP supported instruments to stabilize market prices, with "*high*" intervention price, variable levies, export refunds or production quotas. The result is that farm income support and risk management have often been confused as being one in the same. This confusion continues with direct payments which are sometimes, wrongly, considered as a risk management tool.

As a result of the 1994 WTO Agreement, world agricultural markets have become more competitive, leading to increased EU price volatility and farm income variability. Exogenous shocks are expected to increase due to climate change and international spread of diseases. It is also said that endogenous volatility, due to market participants behaviours, is exacerbating exogenous volatility as agricultural products are now considered as financial assets by portfolio investors.

Public agricultural policy will therefore maintain safety nets for dealing with natural disasters and other major market disturbances from the supply or the demand side. But

private risk management instruments should be the core of the scheme for handling a large layer of risk ranging from "*normal*" to "*catastrophic*". Developing the private risk market is crucial, with or without the support of public policies, and crowding out private market instruments by safety nets should be carefully avoided.

Private instruments include financial contracts, insurance policies, horizontal as well as vertical coordination for risk spreading. Futures markets and derivatives are key elements for intra-annual price risk management. Public support for these instruments remains indirect through education, training and reducing information asymmetry (development of costly information systems). Direct support for private tools is directed more to production risks, and more specifically to risks with a systemic component such as most climatic and sanitary risks.

Apples and Oranges

Risk management policies in the US and the EU are like apples and oranges. They deal with farm income variability but they are orthogonally different in the instruments they support. It is estimated that the respective **"*weight*" of instruments in the US and the EU policies** are the following:

US: 60% insurance, 40% safety nets, 0% income support with direct payments

EU: 1% insurance, 39% safety nets, 60% income support with direct payments

The proportions of the three types of instruments contributing to farmer risk management strategies, including credit management, lead to a vision of **dynamic-integrated US policies versus static-segmented EU policies.**

Insurance policies in the US are largely subsidized. As a result, the acres and the capital insured have increased by a factor 6 over the past twenty years. Some economic studies have demonstrated that the subsidy level may be excessive. Babcock (2013b) has even called the Revenue Protection with an 80% coverage level, the most widely purchased by US farmers, the "Cadillac" policy. **But insurance is a dynamic sector based on a partnership between the public and the private sectors**, developing data-bases for risk assessment, risk valuation, individual loss expertise as well as index-based loss estimates and even fraud reduction**.** Consequently, the Risk Management Agency (RMA) has been able to, by taking advantage of an experience curve, build a Common Crop Insurance Policy, incorporating several types of partially redundant historical policies. A new program to cover shallow losses is proposed in the 2014 Farm Bill based on county-level index used in the group policies for intermediate losses (20% to 50% production loss). In addition, the agricultural products that can be insured are continuously being expanded. The 2014 Farm Bill mandates research on policies for organic products, bio-energy crops, and specialty crops. Risk management also benefits from new or improved insurance policies (livestock diseases, specific production practices, business interruption).

Safety nets in the US have many common parameters with crop insurances. The catastrophic coverage (CAT policy) that covers a 50% production loss "*for free*" is used as a basis, with the same parameters, for deductible buy-up, allowing farmers to choose between a set of deductibles and related premiums. The new counter-cyclical program on adaptive (agricultural) revenue coverage (ARC), individual or county-based, uses parameters similar to those in insurance programs.

Inversely, the direct payments that support EU farm income, the majority of CAP spending, look static and totally disconnected from safety nets and risk management tools. Most of the provisions to manage direct payments in Regulation (EU) n° 1307/2013 (67 articles) are related to administrative repartition within and among MS. Their goals are unclear even though they do play a role in farmer risk management strategies by modifying not income standard deviation but its coefficient of variation (standard deviation divided by an augmented income mean). In addition, the direct payments should have a positive effect on farm liquidity inducing an increased credit capacity. **However, the direct payments do not improve any farm risk assessment or capacity to manage specific agricultural risks.** They may even induce more high-risk behaviour as fixed income is provided to farmers.

The safety net measures are also totally independent from the risk management tools in place in EU Member States, such as private insurance and reference markets. The "old" measures like price intervention and storage aid have no link with any insurance program (or mutual fund). The evident inefficiencies in managing the effects of the Russian embargo in 2014 with the new emergency measures and new reserve funds have proven the need to improve data on farm loss due to either production or market factors.

Finally, risk management tools proposed in Articles 36 to 39 of the Regulation (EU) n°1305/2013 (rural development policy) are more suggestions (optional for MS) rather than effective programs. After ten years of "*options*", numerous studies and regulation adjustments, the new regulation presents risk management as an afterthought, "priority 3, sub-title b" of article 5. It represents one to two percent of the text, far behind local development issues (quality schemes, short supply chains, business diversification). Dedicated research on risk management, advisory services to farmers and training are not mentioned in related articles of the regulation. The three instruments that may benefit from public subsidies are first mentioned in Article 36 and then detailed in three subsequent articles. The first support to enhance **crop insurance (art. 37)** has already been implemented, though by few European countries. It is known that high systemic risks, high loss expertise costs (that could be reduced by the use of indexes authorized in the 2013 regulation) and demand of public or subsidized reinsurance limit the development of such instrument. Effective EU spending to support crop insurance is very limited. Support for **mutual funds to compensate production loss (art. 38)** was already proposed in the 2009 regulation, and it is clear that this Commission proposition did not create a deep movement within MS as only countries with existing mutual funds acted to simply improve their practices. The third instrument, the **Income Stabilisation Tool proposed in article 39**, introduces for the first time the price dimension of farm outputs and inputs. The instrument, based on a mutual fund scheme, looks like a copy-paste of the mutual funds for compensation production losses (art. 38), which is a bit short considering that it deals with such a fundamental issue as farm risk management (90% of the US insurance program). The Measure Fiche provided to MS by the Commission includes no more details for practical design and implementation. For example, it is important to know if accounting documents or farm income proxies should be used.

As a consequence of very vague guidelines for designing risk management toolkit (particularly mutual funds and the IST), **principles and constraints imposed** and the

two-level administrative process of accreditation and control, **it is doubtful that risk management tools in the EU will be developed in the seven years to come[2].**

The dynamic nature of risk management policies in the US is demonstrated by the implementation of ten new insurance policies and safety net programs in six months as opposed to the EU which has embarked in long administrative procedures between MS and the Commission to validate projects **to be co-funded by the EAFRD** (European Agricultural Fund for Rural Development). The dynamic nature of such programs in the US is possible thanks to a **flexible budget** which can be modulated easily in stark contrast with the EU's preference for seeking flexibility within a fixed budget by using contingent financial reserves.

Recommendations

The three suggestions related to risk management instruments found in Regulation (EU) 1305/2013 are based on sound principles: responsibility of agents (individual and groups of farmers, insurers) and MS authorities, low distortive effects and capacity of cross compliance measures in favor of environment and resilience to climate change. However, the two-stages of "*common*" technical decisions to implement instruments behind the principles, the Directorates of the Commission and the MS Ministries of Agriculture (or equivalents) have led to **an administrative maze that impedes the development of instruments adapted to local needs and constraints.** It has become clear that **a better public-private partnership must be established to translate EU suggestions into practical instruments** for the long-term benefits of the food market and the production-conservation of public goods in rural territories.

Ten recommendations for transforming the current state of limbo for EU agricultural risk management policy into a coherent CAP linked to world markets are provided under **four main categories**. A summary of recommendations is presented in Table 1.

Title 1: the need for a coordinated scheme of safety nets and support to specific private risk management instruments

Recommendation 1: Safety net measures related to individual financial compensation should be implemented based on transparent parameters to **evaluate individual farm income loss** due to market, climatic, sanitary or adverse environmental events. Individual parameters as well as income proxy for (heavy) loss valuation should be harmonized with the same ones used for both crop insurers and mutual funds, which will help to price premiums and fees.

Recommendation 2: The EU should support instruments to fill the "*hole*" between the pure financial and insurance markets. Contracts dealing simultaneously with independent and systemic risks, usually called **hybrid contracts**, such as Over-The-Counter (OTC) contracts with a quantity guarantee or **insurance policies** on revenue, product margin and whole farm income should be supported. The new **Income Stabilisation tool (IST)** provided by **mutual funds or insurance** could also fill this gap in partnership with organizations (cooperatives, insurers and banks) to benefit from their specific know-how.

[2] The Commission delivered in February 2015 information on 2014-2020 approved rural development programs. Allocation of funds on risk management measures appears marginal (1.8% of total spending) and without any funding of mutual funds (production or IST). This information, still incomplete, tend to support the idea of very limited development of risk management tools in the coming years.

Recommendation 3: The EU should support the **creation of savings accounts** with validated pre-income tax provisions and withdrawal rules that could fill the "hole" of shallow losses. **The CAP could recognize some taxes exemptions as "national co-financing".** The use of **Direct Payments for provisions to be used in individual savings accounts** should be considered.

Title 2: an openness to move from principles based on constraints to "*no-holds-barred*" field tests as real options for the future CAP

Recommendation 4: The EU should encourage the creativity of the **private sector** to catch the opportunity of the three basic suggestions of the CAP 2014-2020. The EU must support field tests to validate (or not) risk management concepts, articulation of existing methods and additional instruments.

Recommendation 5: Establish **targets for field tests** to develop a learning process (such as use of indexes, proxy models of farm income, multi-annual farm income risk management)

Recommendation 6: Remove all current **constraints on field tests** (WTO Green box, national (fiscal) aid that could be adjusted accordingly to ensure fair competition in the common market, budget inflexibility).

Title 3: the development of adapted resources: research and development networks and financial flexibility

Recommendation 7: Create long-term **collaborative networks of European Universities with research and transfer expertise**. Such networks should support first theoretical analysis of risk management tools and field tests in their design and follow-up. Transfer to extension and advisory services is also required.

Recommendation 8: Create adequate **flexible funding of risk management tools** using first specific **EU reserves**. The agricultural-specific reserve could be expanded by increasing the rates of contribution from direct payments to an adequate percentage in relation with public re-insurance requirements. The reserve must be cumulative from year to year. Flexibility may also be found in individual savings accounts created with (or without) direct payments.

Title 4: an EU organization for risk management oversight

Recommendation 9: Create a "***restructured Pillar 1***" which will, under a single Agency, coordinate and manage risk management issues at the EU and local levels. The EU authority will be in charge of research coordination, field tests, validation of adapted risk management instruments and budget flexibility requirement.

Recommendation 10: Establish **strategic goals for the "*restructured Pillar 1*".** As developing such a plan runs the risk of becoming a long-term project, short term objectives must be set, such as monitoring field tests, cross-pollination between MS, building an experience curve between MS to decrease set-up and operational costs, and valuating public goods that justify subsidies

Table 1: Summary of Recommendations

ISSUES	CRITICAL POINTS	RECOMMENDATIONS / PROPOSALS
1/. EU public and private partnership	Absence of coordination between public safety nets and private risk management tools	Build on common parameters for defining layers of risk. Improvement of risk valuation and premium pricing
2/. Risk coverage in between "normal" and "catastrophic" risks	Discontinuity between financial and insurance markets	Support of hybrid OTC contracts and insurance policies dealing with price and quantity risks as a "Revenue and/or Income Stabilisation Tool"
3/. "Normal" risk coverage	CAP and MS responsibilities	Support the creation of savings accounts based on DPs in recognizing some taxes as "national co-financing"
4/. Openness to move from constrained principles to applied projects	Administrative process for monitoring innovation. Self-censorship for experimentation	Support fields tests as real options on the future of the EU farm risk management. Experience monitoring
5/. Low experience of risk management toolkit	Lack of know-how Lack of adequate database Lack of organisation	Create an experience curve in supporting a structured portfolio of field tests with adequate evaluation
6/. The additive umbrella principle of EU/MS/region	Restrictive interpretation of international, EU and MS regulations	Remove all current constraints on field tests that could be adjusted later. Flexible interpretation of constraints
7/. Research, development and training	Investment is required for designing and implementing instruments, creating common parameters, assessing and pricing risks Training and education	Create long-term collaborative networks of European Universities with research and transfer expertise. Develop educational programs
8/. Financial flexibility	Fixed EU budget and limits of co-financing	Create macro and micro flexible funds (EU nested reserve funds and saving accounts) with adequate participative rates of DPs
9/. Regulatory framework	Dichotomy between two Pillars Lack of coordination	Create an EU Risk Agency with adequate goals, capacities and means
10/. Capacity of implementation	From long term to short term objectives of the Agency	Establish strategic goals. Design the potential experience curve

GENERAL INFORMATION

BOX 1: GENERAL FINDINGS

- *Risk management is a necessity for competitive agricultural markets with increasing exogenous and endogenous price volatility. Exogenous volatility due to adverse climatic and sanitary events is augmented by an endogenous volatility related to the improved integration of agricultural commodities into the full array of financial assets.*
- *The 2014 US Farm Bill focuses on ex-ante risk management instruments structured with safety net measures. All fixed direct payments have disappeared.*
- *The EU CAP 2014-2020 concentrates most of its resources on fixed direct payments, reducing their compensatory role for price decline and support of farm income and "greening" the incentives for a sustainable agriculture producing improved public goods (food quality, environment, biodiversity and measures against climate change). Safety nets are still included but with limited range and financial capacities. Risk management tools, discussed for a decade, remain in the state of limbo.*
- *Developing public policy in the field of risk management is complex as the main instruments are in the private sphere. Public policy can support the development of on-farm risk management instruments, including prevention and methods of resilience against adverse natural events. It can also support the private risk market (actors, instruments, methods), from the financial to the insurance markets, from individual to mutual instruments.*

BOX 2 : KEY WORD DEFINITIONS

Revenue versus income

- *Commodity revenue, sometimes called gross income, is defined as the product of yield times price times the number of production units*
- *Commodity income, sometimes called net income, is defined as the difference between the commodity revenue and the input costs, such as operational costs*

Risk management versus safety net

- *Risk management instruments are ex-ante measures that allow farmers to modify their business and financial risk exposure in order to match their willingness and capacity to support losses due to the occurrence of adverse events. They are mainly private. Agricultural policies may support the availability and use of such tools*
- *Safety net instruments are mainly ex-post measures that support farmers directly during market crisis or local natural disasters. Measures are described in commodity programs of public policies that define conditions of public intervention, such as type and level of triggers, loss franchise or coverage level. They are incorporated into the risk management strategy of farmers. Such public instruments should be differentiated from farm income supports like fixed direct payments that have a different goal even though they may indirectly affect farm risk management through a wealth effect and improved credit capacity.*

1. RISK MANAGEMENT TOOLS AND PUBLIC POLICY

KEY FINDINGS

- Risk management is the decision to modify risk exposure (business and financial) with respect to personal wealth (or firm equity) and risk aversion.

- Agricultural risk management is a necessity for allowing optimal production decisions such as types of production, seeds, intensification of inputs and optimal investment decisions such as development of units of production, buildings or machinery.

- Risk management is different from farm income support. Risk management instruments are ex ante measures to reduce the expected farm income variance and/or modify the left-tail (the tail of low incomes due to market or production losses) of the expected income distribution.

- Risk management instruments are mainly private. They may concern on-farm measures and methods such as product diversification. They may be market instruments, from insurance contracts to derivatives contracts on futures and OTC markets. They include all mutual institutions like cooperatives and mutual funds. They may be supported by public policy.

- Public agricultural policy should offer safety nets to deal with catastrophic events and major market disturbances as a common good worthy of national support. A public policy may also help farmers to create the financial reserves to cope with normal business risks. Safety nets and private risk management tools contribute to the so-called "*farm income stabilization scheme*", usually used as a public policy objective.

- Public policy should tend to ensure the availability of risk management instruments and safety nets for the full array of specific agricultural risks, mainly market, climatic and sanitary risks for main crops and specialty crops as well as livestock production. Links between public safety nets and private risk management instruments should be carefully organized to avoid the exclusion of private instruments by public ones.

1.1. Risk management in agriculture

Risk management is needed when shareholders consider that business risk is not supported by adequate capitalization, mainly equity and financial reserves. Agriculture has specific business risks such as climatic, sanitary and market risks due to traditional exogenous shocks on supply conditions. Shocks on demand conditions (Bovine Spongiform Encephalopathy in 1996, supposed E. Coli in cucumbers in 2011, etc.) are now specific as media are able to highlight food safety problems and create drops in demand for related food products. The internationalization of trade combined with food traceability can spread a local safety shock to the global scale. Finally, agricultural products are now considered as financial assets that can be easily introduced into diversified portfolios by using new means of investment, such as index tracking investment funds. As a consequence, price volatility is spreading from one commodity asset class to another. The volatility of agricultural

products is now related with shocks on commodity markets, energy and metals, as well as all pure financial assets.

Risk management is a necessity to adapt the perceived risk level, both business and financial, to the capacity of supporting income loss. If the firm is not able to manage risk efficiently, the operational and investment decisions will be sub-optimal. For instance, a farmer will choose seeds, level of production inputs and acreage which are not optimal with respect to the agronomic potential. Investment in machinery and buildings may be postponed or abandoned even though market signals are favorable. As a result, such a farm would develop higher production cost, leading to a loss of long-term competitiveness. Farmers may even ignore high price signals due to increasing world demand and using much lower certainty equivalent price for investment decisions, leading to long-term worldwide supply shortages.

Risk management is intrinsic to agriculture. From the very beginning of agriculture, farmers selected seeds adapted to soil and climatic conditions. Additionally, they selected genetic traits for more stable and reliable growth. Livestock producers have always managed herds to minimize outbreaks and spreads of disease. Prevention and on-farm risk mitigation through various diversification practices have been common practices for centuries. Modern farm specialization induced by technological and organizational factors increased income risk and reduced traditional risk mitigation practices. As a consequence, farmers in many countries turned to mutualistic methods for dealing with market risks as well as production risks. Agricultural cooperatives, mutual banks and mutual insurance have been created and developed over time to deal with specific agricultural risks. Public policies have usually helped support such developments.

It is believed that **specific agricultural risks will increase** in the coming decades due to exogenous shocks on supply and demand and the increased integration of agricultural products and markets within the financial world. It is also believed that trade liberalization as supported by the WTO is smoothing the impact of local production shocks. Worldwide trade liberalization requires fair competition between countries and therefore, policies that distort markets policies should be dismantled. The Agreement of Marrakech in 1994 is a cornerstone for national agricultural policies. In particular, it stipulates that all price supports must be dismantled as they are considered to be market distorting tools. To comply with the Agreement, the US and the EU then developed various farm income support measures decoupled from agricultural products and production, such as direct payments proportional to historical farm assets.

Farm income is usually defined as the difference between the revenue from the sale of agricultural products (augmented with direct payments related to production units[3]) and the costs of production. It is not the farmer's income as non-agricultural products and services may be produced on the farm and sold on the market. In addition the family income may be augmented by off-farm activity of the spouse. It is well-established that family income and related volatility induce short and long-term economic decisions (Cafiero 2005). It is also well known that access to the credit market is a key influence on behavior under risky conditions.

Risk management tools first deal with **unitary risks** such as: price, yield and quality per type of production. Hail insurance or commodity price option contract on the OTC market

[3] The proportion of aid relative to the direct market revenue may be very high for some types of farming. See EC, 2014.

are examples. Tools also deal with **combined risks** such as: revenue per unit of production computed as yield times price, margin on variable costs computed as revenue per unit of production minus variable and usually stochastic costs. Since 1996/1997, American insurers have been offering various types of revenue insurance per acre for many national crops. Finally, risk management tools deal with **whole-farm combined risks** where all productions are aggregated. Farm income may be insured in the U.S. even though such insurance policies have little to no commercial success.

1.2. Risk characterization

Literature on risk is varied as the concept has become increasingly important as a result of market liberalization. In addition, the perception of risk is highly subjective and linked to cultural and structural factors. As a consequence, the precise definitions of words like "*market crisis*" or "*price volatility*" which are often qualified as "*excessive*" or "*catastrophic events*" are not clear. Even risk concepts in finance and in insurance sectors are not homogeneous. Usually, risk in finance is analyzed through parameters of dispersion around the mean. Standard deviation, skewness and kurtosis are basic characteristics of price distributions of financial assets. There is therefore a risk of loss due to price decrease but there is also a risk of gain due to price increase. In the insurance field, the expected value of loss is crucial. The structure of loss distribution is key for estimating the actuarial premium and the requirement of re-insurance. To analyze farm risk management tools, in particular those supported by public policies, this note will consider risk as an adverse consequence of a random event. The technical cost of risk is then measured by the value of the loss times the probability of occurrence.

Risks, and agricultural specific risks in particular, can be characterized for assessment and later for management with adequate tools. Cafiero (2005) presents risks using three axis. The first axis is related to the **frequency of occurrence** of the adverse event, from low to high frequency. The second axis is related to the **average value of the loss** due to the adverse event. The loss may be limited or very large with respect to some ad hoc referential. Current terminology used in the US is of "*deep*" or "*shallow*" loss. Finally, the third axis is related to the **independence of the probability of occurrence** of the adverse event. A risk is called **"*idiosyncratic*"** if the probability of occurrence for a concerned economic agent is independent from the probability of occurrence of another agent. A risk is called **systemic** if the probabilities of occurrence of a consistent number of agents are correlated[4].

Cordier et al. (2014) use a similar approach for mapping the main tools of farm risk management in a European country. They use a two-axis analysis for clarity but also because it is possible to combine the frequency and loss value axis into a single axis of expected loss. A risk with low expected loss is called "*normal*" (or **"*wise*"**) and a risk with high expected loss is called "*catastrophic*" (or **"*wild*"**). Under this two-axis referential, they first position the private risk market, including private instruments that may or may not be supported by public policy. They identify areas that require purely publicly supported instruments.

[4] A more sophisticated approach is related to copulas.

1.3. Methods of risk management

- Prevention to **modify the probability of occurrence** of the adverse event or **modify the value of the average loss.**
- Smoothing methods are basically **compensating "*lows*" by "*highs*"**. If an adequate pivot is chosen, "*lows*" and "*highs*" are equal and therefore the average level can be maintained through the years. Averaging techniques have no actuarial costs. However, they develop some management costs and fiscal issues.
- **Diversification** methods are also methods for mitigating risks under the portfolio model. They may be applied to production and market risks. These methods may be used "*on-farm*", like production diversification or "*off-farm*", like diversification of selling times using forward contracts during the growing period (before harvest) and spot contracts during the storage period (post-harvest). They are also free of actuarial costs.
- **Selling risk to a third party** is the last method for adjusting the level of risk supported by the firm to its willingness. Tools are required on the risk market for allowing the transfer of risk against payment of a premium. Option and other derivative-like contracts are financial means for price risk management. Standardized option contracts are priced on futures markets whereas derivative contracts, customized between two parties, are priced on the OTC market. Insurance contracts are also a means for selling farm risk, usually production losses due to climatic or sanitary adverse events, to a company that pools individual risk exposures.

The willingness of farmers to use risk management tools is related to the perceived business risk, subjective probability of loss and expected loss value, that may be different from the objective business risk. The individual risk aversion, the farmer's level of debt, the average level of income and "*chance*" of having a very low farm income[5] may also affect the willingness to reduce the farm income distribution and/or to truncate the left tail of the distribution, the "*downside risk*". In the end, the final risk management strategy implemented by farmers will integrate safety net programs, direct payments and costs of insurance policies net of subsidies.

Fixed payments to support farm income should not be considered as risk management tools *per se* as they do not modify the income distribution, either in variance or in the left tail of the distribution. They translate the expected mean and therefore change the value of risk parameters such as the income coefficient of variation or the VaR (5%). In addition, the wealth effect of such payments are supposed to change the farmer's risk aversion with an impact on production decisions such as types of production, intensification level or types of investments[6] (Femenia et al. 2008).

Different types of farming present various sources of income volatility. For instance, income volatility of grain farming is mainly related to yield and output prices whereas income

[5] That may be assessed using Value-at-Risk (VaR) methods.

[6] However, it is common to read in reports and studies that direct payments contribute to the stability of income as a principle. For instance, the DG Agri publication (2011) on "*Evaluation of effects of direct support on farmers' income - Common Agricultural Policy Evaluations*" stated, without further explanation (p. 10) that "*direct payments make a positive and significant contribution to the stability of income*". This statement is based on a study performed by Agrosynergie (2011) which "*proves statistically*", as a tautological contribution, that increasing the average income by fixed payments reduces the income coefficient of variation. A more recent study performed by Agrosynergie (2013) on the structural effects of direct support avoids any analysis of farm income stabilization.

volatility in livestock production, poultry and pork, is mainly related to the output-input price ratio volatility. Therefore, specific agricultural risks affect the various types of farming differently. In addition, levels of income risk are quite different among the types of farming as presented in Table 2[7]. As a consequence, farmers should use adapted risk management tools with respect to their types of farming, their farm size and their financial structure.

Table 2: Comparative risk of four major types of farming in France in 2007

Type of farming	Fruit trees	Main crops	Pig	Bovine-Milk
Coefficient of variation	0.74 %	0.41 %	0.84 %	0.39 %
VaR (5%)	-14,200 €	+16,900 €	-19,700 €	+22,300 €

Source: Cordier 2008.

1.4. The risk management tools

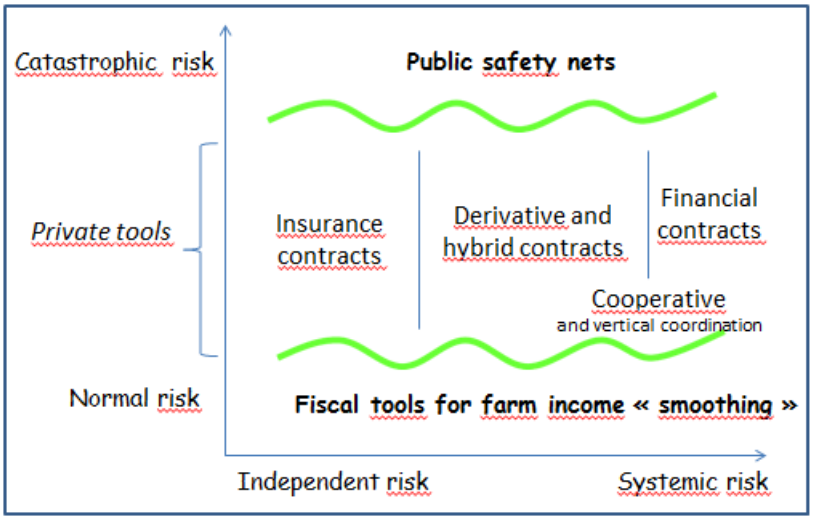
The **first risk management tool** is an adequate level of equity mainly created by year-after year positive after-tax financial results and savings. In addition, long-term loans and short term credit help develop the capacity to adjust to normal business risks. The credit market is therefore fundamental for general business risk management. Public policy tools can support the creation of such equity levels. A savings account that can receive income tax exempt contributions and withdrawals under market or production conditions develops farm equity to deal with "normal" farm business risks.

Catastrophic events, such as natural disasters, are by definition deadly events for farm activity. It is common that **State aids** provide *ad hoc ex-post* payments to help farmers to remain solvent. Catastrophic insurance is also provided to US farmers, quasi-free of charge. It is a publicly subsidized *ex-ante* risk management tool against climatic natural disaster managed by the private sector. *Ex ante* tools are supposed to be more economically efficient as they support prevention measures leading farmers to be more responsible and responsive to specific agricultural risks. They may however be limited by a "crowding out" effect of systematic government intervention.

Public policy should therefore define how to support the first layer of farm risk that should be covered by farm equity and when losses due to natural disasters and crisis should be covered by the State (Cordier et al. 2014). These **two levels of agricultural policy** are illustrated in Figure 1.

[7] After standardization of farm income at a common level for four representative segments of specific agricultural risks (mono or pluri production, crop or livestock production), the income impact of market and production risks have been simulated with a Monte-Carlo approach. Income coefficients of variation and VaR (5%) have then been estimated for assessing and comparing farm risks per representative segments of French farms.

Figure 1: Mapping of risk management and safety net instruments



Source: adapted from Cordier et al. 2004.

Between the two areas for public instruments, the **private risk market** should provide adequate instruments for managing independent as well as systemic risk. The private market is an "*area*" which includes not only **financial and insurance contracts** but also **coordination contracts within the food chain**[8]. Agricultural cooperatives in some European countries are able to manage "*averaged annual prices*" to the benefit of affiliated farmers in pooling crop sales[9]. Coordination contracts may also be multi-actors when food processors, and even retailers, are involved in managing production and market risks with producer organizations.

The financial contracts are usually **derivative contracts** built locally by market intermediaries on the OTC market[10]. They are related to close or distant reference markets and reference prices with a time-dimension. Futures markets are the best organized markets for creating reference prices. Such markets exist for main crops and a few livestock products. But the number of liquid futures contracts is limited around the world and the question of market completeness is often discussed. The support of a public policy is usually limited as commercial relationships are private. Apart from a support to reference market development and sound vertical coordination within the food chain, public policy should ensure fair market behavior with a high level of liquidity and a high level of public information (to reduce the adverse consequences of asymmetric information). Market regulation is also required, as for any financial market, to limit the systemic risk of default[11].

8 Measures for improving food chain organization as described in Regulation (EU) N° 1308/2013 are positive for the development of efficient vertical (and horizontal) coordination.

9 US cooperatives do not pool market risks for major productions except dairy cooperatives.

10 The OTC market is not transparent by nature and its size is difficult to estimate. However, new regulations in the US and the EU are requiring the clearing of swap contracts that should create additional pertinent information (Peterson 2014).

11 Such requirements are the subject of ad-hoc regulations in the US and in the EU. The Commodity Futures Trading Commission (CFTC) is developing rules to fulfill the Dodd-Frank Act requirements while the European Securities and Market Authority (ESMA) is working on equivalent rules to fulfill the MiFID2-EMIR-MAD regulatory package. New regulations against market manipulation are being implemented in the EU that are already in place in the US. However, a recent study for the European Parliament (SOMO, 2014) highlights the limits of the EU (and US) regulation on agricultural derivatives and concludes that "*the perspective of EU farmers and the food chain has not been explicitly taken into consideration in the new legislation framework*".

Insurance contracts are usually related to production risk for plants and livestock. Historically, private insurance covered losses due to hail and frost for crops or accidental deaths for livestock. Such policies are still dominant in most European countries. Later, multiple peril crop insurance covering losses due to major climatic events, with or without deficit and excess of precipitations, were proposed in the US and in some European countries, supported by public subsidies. **Hybrid contracts** on crop revenue and livestock margin are the most recent insurance policies in the US. The contracts cover losses due to production adverse events and/or market price decrease per type of commodity. As a consequence, they "*link*" the financial and insurance markets in an attempt to efficiently manage a combination of unit risks as opposed to managing individual unit risks. The ultimate contract would be **whole-farm income insurance**, compensating for income loss of diversified revenues minus total variable and fixed costs. Such an insurance contract is difficult to design and implement as the background information it requires is extensive, its procurement may be delayed by technical constraints and some specific issues of moral hazard may arise. The US has designed such a contract based on accounting documents, but for now, such policies have had very limited success. Research is still underway in the US to improve design.

To conclude this part of the note, it must be emphasized that agricultural risk management is a fundamental issue for world food supply. Farmers need adequate tools and methods to handle increasing production and market risks which will stabilize their income.

Public policies in the US and EU have fundamental objectives of national and international food safety, agriculture and food chain competitiveness, fair standards of living for farmers, sustainable agriculture and more recently resilience to climate change. For decades, they have been offering safety nets to crop and some livestock producers[12] either by means of stabilizing markets (the "*old*" EU CAP) or deficiency and counter-cyclical payments (the "*old*" US Farm Bills). They also complemented the development of private risk management tools, in the financial and insurance spheres, with a more intra-annual risk management horizon. Before and after the WTO agreement in 1994, agricultural policies have been adapted in a convergent manner to support farm income rather than price support in order to improve fair world market behavior[13].

During the last decade, the US and the EU have adjusted and adapted their agricultural policies to fulfill their own objectives. Therefore their once converging policies have started to diverge. The 2014 Farm Bill and the CAP 2014-2020 are contemporaneous texts presenting the transatlantic policies for the next five to seven years. They are presented in the following sections before a comparative analysis.

[12] In the EU, safety nets programs have been more directed towards bovine and dairy producers than hog or poultry producers. In the US, with the exception of dairy, there have been no safety nets for livestock.

[13] Budget constraints may have also contributed to such change.

2. THE CASE OF THE US

KEY FINDINGS

- Safety nets: after a decade of agricultural policy (1985-96) that shifted from price support programs to income support through direct payments in the simultaneity with the 1994 WTO Agreement, the US started to implement new counter-cyclical programs in 2002. Fixed direct payments were the most important farm support device during the period 2002-2013 as crop prices were above price triggers for countercyclical programs and marketing loans. Disaster payments were also very common

- Crop insurance programs that existed since the 1930s were expanded as a major public policy in the 1980s, using subsidies for developing farmer participation. A public-private partnership was created for research and development of agricultural insurance, leading to improved traditional yield protection policies but also innovative policies on commodity revenues, livestock margins and whole-farm income policies. The federal Risk Management Agency (RMA), created in 1996 is monitoring the development of insurance programs. The cost of insurance programs increased, as an estimation, from $1 billion per year in the mid 90's to $8 billion in the 2010s. Through time, the subsidies to premium are about 90% of the total cost spending including 90% of premium subsidies and 62% of the total premium value.

- The 2014 Farm Bill is adjusting commodity programs under Title 1 in refitting two counter-cyclical programs based on fixed price levels (PLC) and adaptive revenue levels (ARC). A new program to protect dairy margin is created, very much like an insurance policy but fully managed by the Farm Service Agency. Disaster Assistance programs are also extended. But all direct payments are removed with a Congress expectation of a $2 billion cost reduction per year in total commodity programs. However, this expectation is based on limited spending in counter-cyclical programs (in other words, limited price decrease during the Farm Bill period)

- The historical crop insurance programs, organized mainly under the Common Crop Insurance Policy, are maintained. New programs for covering "shallow losses", SCO for main crops and STAX for cotton are provided

- Finally, risk management instruments represents the major dimension of the US agricultural policy, in front of the safety net programs

2.1. Historical trend of risk management tools in the US

Since the 1930s, US Agricultural Acts (usually called Farm Bills) have focused on farm commodity programs to support agricultural markets and farmers' income in order to reach parity with other economic sectors and deal with agricultural risks and disasters. Additional programs related to food consumption, conservation, and recently bioenergy were developed in recent decades. The latest US Farm Bill developments are well documented in a note to the European Parliament (Bureau 2012).

2.1.1. Historical trends on commodity programs

With the 1985, 1990 and 1996 Farm Bills, the commodity programs shifted from price support schemes to income support through direct payments (DP)[14], politically in line with the upcoming 1994 WTO Agreement. The **2002 Farm Bill** changed such a trend in keeping direct payments mainly decoupled from production but simultaneously creating a new counter-cyclical payment (CCP) program directly compensating for an "*effective*" price, an augmented average market price, lower than a target price level. The CCP was intended to replace the ad hoc market loss assistance payments for providing an effective safety-net to farmers.

The **2008 Farm Bill** is an expansion of the previous one. It continued the commodity programs, such as DP and CCP but also the historical marketing loan programs, and created (i) a new countercyclical program based on farm revenue, called Average Crop Revenue Election (ACRE) and (ii) a new program for catastrophic events, called Supplemental Revenue Assistance Payments (SURE) designed to complete the insurance scheme compensating for whole-farm losses due to natural disasters[15].

In the 2008-2013 period, the fixed DPs were the most important farm support device as crop prices were above marketing assistance loan rates as well as counter-cyclical target prices.

2.1.2. Historical trends of crop insurance programs

The **Federal Crop Insurance Act in 1980** expanded the limited crop insurance program launched in the late 1930s by the Federal Crop Insurance Corporation (FCIC) to many crops and many regions. A subsidy of 30% of the premium for a 65% rate of coverage was proposed in order to develop farmer participation. Later, to improve national coverage with the crop insurance scheme, the **Federal Crop Insurance Reform Act of 1994** linked the deficiency payments under price support programs to crop insurance participation. The catastrophic coverage (CAT) was then created, sold by both the Farm Service Agency and insurance companies. The 1996 Act introduced partial decoupled direct payments, repealed the set-aside program and launched several experimental programs on price risk management. In the same year, the Risk Management Agency (RMA) was created to administer the FCIC programs and other risk management tools.

In 2000, the Agricultural Risk Protection Act (ARPA) expanded the role of the private sector for research and development of agricultural insurance. A private-public scheme was installed from the insurance contract design including premium value to re-insurance agreements. An expert panel was created to provide assistance to the RMA in evaluating new insurance concepts and contracts. Premium subsidies were also increased to promote the development of innovative contracts and develop incentives for higher coverage rates.

Insurance programs were continued in the 2002 Farm Act under the "Miscellaneous" title (Title X) and did not present major changes[16]. The 2008 Farm Bill created a specific Title (XII) for crop insurance and disaster assistance programs.

In 2011, the RMA rationalized the diversity of policies coming from various initiatives from the private and the public sectors **into a Common Crop Insurance Policy.** The new

[14] It can also be argued this shift began in 1973 with the introduction of target prices and deficiency payments.
[15] However, this program was administered by the Farm Service Agency (FSA) as a commodity program.
[16] Insurance programs are "*permanent*" and do not require reauthorization like commodity programs in Title I. Recent Farm Bills (2002, 2008 and 2014) made changes to the permanent act.

common policy, dedicated to main crops, combined the Actual Production History (APH) and CAT policies into a Yield Protection (YP) policy[17], the Crop Revenue Coverage (CRC) and Revenue Assurance (RA) with Fall Harvest Price Option into a Revenue Protection (RP) policy, and the Revenue Assurance without Fall Harvest Price Option, the Income Protection, the Catastrophic Risk Protection Income and the Indexed Income Protection (IIP) policies into a Revenue Protection with Harvest Price Exclusion (RP-HE). The Common Crop Insurance Policy is the basis for developing policies on additional agricultural products.

Two additional types of crop insurance are of importance (more qualitative than quantitative) as illustrated in Table 3. First the Area Risk Protection Insurance (ARPI) policies which represented only 1% of the total policies sold in the US in 2013 and 4% of the total liabilities covered, and second, the whole-farm income insurance policies (Adjusted Gross Revenue (AGR) type) which are not very common (less than 1% of policies sold and liabilities covered).

Three plans of area-based insurance are available under the Area Risk Protection Insurance (ARPI): Area Yield Protection (AYP) (formerly Group Risk Protection GRP), Area Revenue Protection (ARP) (formerly Group Risk Income Protection GRIP) and Area Revenue Protection with the Harvest Price Exclusion (ARPwHPE).

AYP is a yield insurance using county yields as the basis for computing the loss and later the indemnity instead of individual farm yield. County yields are determined by the National Agricultural Statistical Service (NASS), a branch of the U.S. Department of Agriculture. NASS releases county yields in March of the year following harvest. The policy pays indemnities when county yield falls below a yield guarantee, an historical county yield times a farmer's chosen rate of coverage (70 to 90%).

ARP is a revenue insurance paying indemnities when actual county revenue is lower than a revenue guarantee chosen by the farmer. Such a guarantee is computed as the expected county yield (historical average) times best of the expected price at planting time or at harvest time (futures prices on the Chicago Board of Trade CBOT) times a rate of coverage (70 to 90%). The actual county revenue is the county yield as stated by the NASS times the futures price at harvest time. ARPwHPE is based on the same principle as the ARP except for the price reference which is only the planting time price, therefore excluding the harvest price.

Adjusted Gross Revenue (AGR) and Adjusted Gross Revenue-Lite (AGR-L) provide protection against a whole-farm revenue decrease due to low market prices and/or yields. Covered revenue is in fact income from agricultural commodities. The AGR and AGR-L policies use the Internal Revenue Service (IRS) tax form and an annual farm report as a base to elicit the guaranteed farm income, the current farm income and the loss to be indemnified with respect to the chosen coverage level. AGR and AGR-L, very similar policies, are available in different States and for selected counties.

US insurance programs have been a success considering their growth in participation over the past twenty years. Several variables may be used to assess such growth. The number of acres insured increased four times from 70 to 210 million acres from 1990 to 2011[18], the liabilities covered increased six-fold from $20 to $120 billion (in 2012 USD) and premiums have jumped by six from $2 to $12 billion.

[17] The Actual Production History (APH) policy is kept in addition for crops without commodity exchange price discovery.

[18] An improved variable could be "*insured acres with buy-up coverage*".

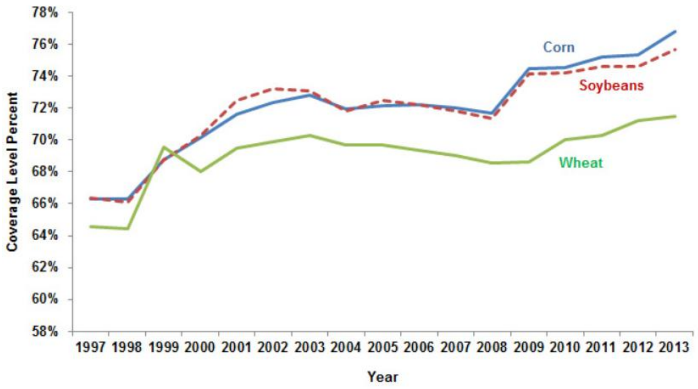
Subsidies are a crucial issue on insurance development and economic efficiency. The impact of subsidies on insurance development has recently been analyzed (O'Donoghue 2014). Increase in premium subsidies generally tends to induce farmers to increase the size of acres insured, but more importantly, it tends to increase the rate of coverage. US insurance program efficiency has been discussed for years. Babcock (2012) estimates for instance subsidies induced a strong increase in taxpayer cost from $3 billion in 2001 to $8 billion in 2012 and criticizes the impact of subsidies in the shift of farmers from basic yield coverage to the "*Cadillac*" RP policy (66% of policies sold as indicated in Table 3) with increasing coverage levels (illustrated in Figure 2). As a consequence, during the preparation of the 2014 Farm Bill, Babcock (2013a, 2013b) advocated cutting budget costs by lowering benefits of over-insured crops and reducing administrative and operating reimbursements to private insurers.

Table 3: Crop insurance use by product in the US, 2013

	Policy sold		Liabilities	
RP	1 393 868	66%	90 656	73%
RPHPE	15 676	1%	1 289	1%
YP	685 761	32%	20 107	16%
ARPI	25 447	1%	4 348	4%
AGR + AGR Lite	805	0%	469	0%
% total crop insurance	2 121 557	97%	116 869	94%

Source: Author from Summary of business data, Risk Management Agency.

Figure 2: Average coverage level[19] over time on Revenue Protection in the US



Source: Schnitkey and Sherrick (2014).

[19] Coverage levels are weighted by the acres insured.

2.2. The 2014 Farm Bill

2.2.1. Design of the main tools supporting farmers' income

Public Law 113-79 of February 7 2014 (US GPO 2014), referred to commonly as the "*2014 Farm Bill*", contains twelve titles covering an array of agricultural and food programs. Two titles are dedicated to farm risk management, Title I for Commodity Programs and Title XI for Crop Insurance. Crop insurance may be considered as the main tool for US agriculture risk management as it tends to cover the full array of products (main crops, more than 80 specialty crops, livestock) while commodity programs are limited to main crops and some livestock production. The 2014 Farm Bill improves also links between crop insurance premium subsidies and compliance with wetlands and highly erodible lands conservation provisions (Coppess, 2014).

Title I: Commodity Programs

Title 1 repeals three commodity programs for crop year 2014, the Direct Payments, the Counter-Cyclical Program, the Average Crop Revenue Election (ACRE) program and the Supplemental Revenue Assistance (SURE). Two new programs are established: Price Loss Coverage (**PLC**) and Agricultural Risk Coverage (**ARC**) designed to supplement crop insurance. Producers must choose to enroll in one of the two programs for the 2014 Farm Bill period. Cotton producers are not eligible for PLC or ARC but they benefit from the Stacked Income Protection Plan (STAX), a new crop insurance proposed under Title XI[20]. Title I adjusts payment limitations and gross income eligibility rules. Finally, a new program is also offered to milk producers, the Dairy Margin Protection Plan (**DMPP**), replacing the Milk Income Loss Contract program, enacted in 2002, that provided counter-cyclical revenue support under a limited volume of production (maximum around 140 dairy cows).

The marketing assistance loan program for main crops and sugar loans are maintained.

The Noninsured Crop Disaster Assistance Program has been adjusted to offer additional "*buy-up*" coverage above the catastrophic loss level, similar to crop insurance schemes. The Livestock Forage Disaster Program, the Livestock Indemnity Program, the Emergency Assistance for Livestock, Farm-Raised Fish, Honeybees as well as the Tree Assistance Program are either maintained or adjusted to new production conditions.

Price Loss Coverage (PLC): Payments are provided to producers for main crops when market prices fall below a fixed reference price. The payment rate is equal to the difference between the reference price and the maximum between the annual average market price and the marketing assistance loan rate. For each covered agricultural product, the payment amount is the payment rate times 85% of historical acreage of the product times (historical) yield.

The PLC is a new form of counter-cyclical program. However, the 2014 Farm Bill reference prices are higher than the previous counter-cyclical target prices (wheat $5.50/bu versus $4.17, corn $3.70/bu versus $2.63 or soybeans $8.40/bu versus $6.00).

[20] The exclusion of cotton from commodity programs in the 2014 Farm Bill could be related to the long-running trade dispute with Brazil (D. A. Shields 2014, Congressional Research Service) that ended finally late September 2014.

Agricultural Risk Coverage (ARC) program: Producers first may choose between individual or county-based revenue coverage.

In the individual-based coverage, payments are provided when the actual individual market revenue, as the sum of all covered product revenues, is less than the individual ARC coverage. This coverage is equal to 86% of the farm's "*historical*" revenue computed as the weighted (acreage) sum of revenues computed as the national "historical" price (five-year Olympic average using the maximum of the national or the reference price) times the five-year Olympic average individual yield. The payment amount is the individual farm payment rate (guarantee minus actual revenues) times 65% of total historical acreage of covered products.

In the county-based coverage, for each commodity chosen by the farmer, the payments are provided when the county crop revenue (actual average county yield times the national average price) is below 86% of the county benchmark revenue (five-year Olympic average county yield times the five-year Olympic maximum of the national and reference prices). The payment amount is the county payment rate (county crop revenue per acre minus actual minus actual crop revenue per acre) times 85% of the product historical acreage.

The individual-based ARC program is a new form of whole-farm revenue-benchmark coverage that replaces the SURE program while the county-based ARC program is a new form of product revenue-benchmark coverage that replaces the ACRE program.

Dairy Margin Protection Plan (DMPP): It is a major change as the DMPP integrates feed costs into the safety net scheme without production caps (Newton 2014). DMPP payments are provided when the difference between the national average milk price and the formula-pricing of feed costs falls below the margin trigger selected by the milk producer. The production base to start will be the best of the three past years and will be revised annually. The producer can choose to cover from 20% to 90% of his/her production base. The payment amount is the actual "*margin*", the price difference times the covered milk volume, times the chosen coverage rate.

The program looks like an insurance policy with choice of coverage levels and related premium rates, fixed for the Farm Bill period, but the FSA is the contract provider without any private-RMA public management in gross premium evaluation and partial private reinsurance. In other words, the US taxpayer is fully covering the contracted dairy margin risk (Newton et al. 2014).

Title XI: Crop Insurance (and Title XII Miscellaneous)

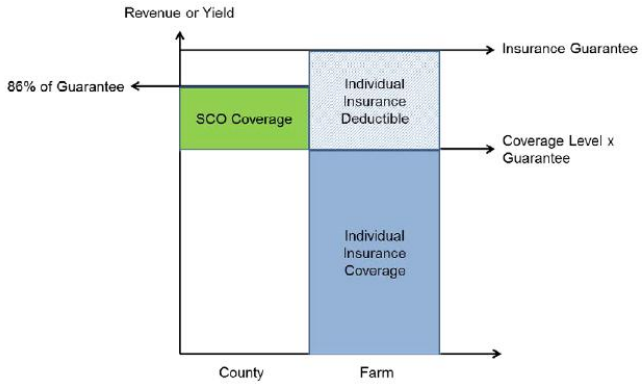
Title XI enhances coverage of the crop insurance program dedicated to cover commodity-by-commodity yields, revenues and margin, on an individual or group basis. The whole-farm income insurances are also revisited in combining AGR and AGR-Lite into a new **Whole-Farm Revenue Protection** policy.

Two new programs are launched: the Supplemental Coverage Option (**SCO**) for main crops, the Stacked Income Protection Plan (**STAX**) for cotton producers.

SCO is county-level revenue or yield based insurance that "*supplements*" a portion of losses not covered by traditional crop insurance (revenue policies such as RP or RP-HPE, or yield policies such as YP or ARPI). The amount of coverage is dependent on the coverage level choice for the YP or RP type policy. For instance, an SCO with a 70% RP policy will

provide a county-level revenue coverage from 70% to 86% if the county loss is 14%. The subsidy rate for SCO is set at 65%. If the county loss is greater than 14%, the SCO payment will be computed using the current county loss rate and the individual coverage rate. Figure 3 illustrates the principle of the SCO coverage with a 14% county loss.

Figure 3: Illustration of SCO coverage (with an exact 14% county loss)



Source: Paulson and Coppess 2014.

Farmers with SCO policies may participate simultaneously in the PLC commodity program but not the ARC program

STAX may be purchased by cotton producers as area-based revenue insurance or as supplemental county-revenue coverage to a "*traditional*" RP policy. The maximum deductible is 20% with a 80% premium subsidy. Producers using STAX coverage are not eligible for the SCO coverage.

Specific provisions for production insurance are also provided under Titles X, XI and XII:

- beginning farmers and ranchers benefit from additional rates of premium subsidy and lower catastrophic fees and some advantages for estimating "*historical*" yields,
- organic production benefits from several improvements: eight new product policies, lower fees for price options in contracts and coverage at the contract value of the organic production.
- coverage level by practice that allows a farmer to differentiate insurance policies with respect to production practices (dry and irrigated lands for instance)
- allowance to drop a year in the computation of the "historical" yield if the yield is catastrophic (more than 50% yield loss)

Several research programs have been authorized to study a set of innovative insurance programs dealing with bio-energy crops, livestock diseases, adverse food safety events for specialty crops and business interruptions.

2.2.2. Scope of the main risk management tools

Commodity programs

The programs offered by the FSA are risk management tools based on individual farm data and market conditions. They create a safety-net for producers with multiple options of risk management (price or revenue coverage, level of coverage, pure individual versus area references, fixed versus moving-average references). The PLC and ARC commodity programs may be considered as counter-cyclical based respectively on fixed reference prices and moving average price and yield levels. Producers who must choose between the

two programs are facing the dilemma of the certainty of fixed reference prices versus the flexibility of annually adjusted revenue (county) coverage (Effland 2014).

Crop insurance

The 2014 Farm Bill strengthens crop insurance programs administered by the RMA by extending existing policies to new products including organic products and specialty crops, new categories of producers (new farmers, ranchers). Innovation is supported by research programs on coverage for specific production risks as well as combined risks, revenues and margins by commodity or whole-farm.

But the most important innovations are the SCO and STAX programs that provide area-based revenue coverage on "*shallow*" losses to complete the individual scheme of individual rate of coverage.

2.2.3. Spending of the main risk management tools

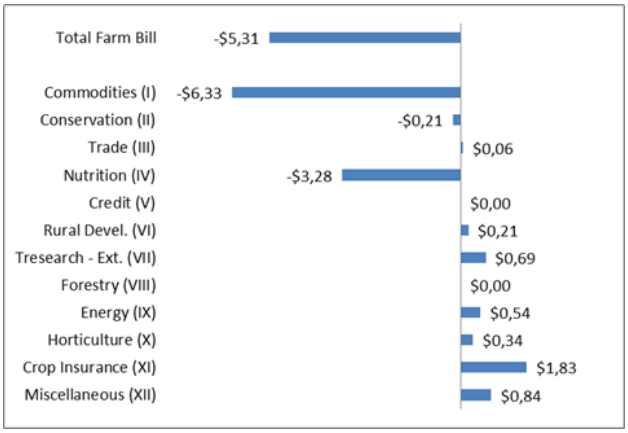
The Congressional Budget Office (CBO) has provided estimates of direct spending by title (CBO 2014). The total cost of mandatory programs is estimated at a $489 billion over the five-year period 2014-2018 of the 2014 Farm Bill and about twice as much for a ten-year perspective. These costs do not include the costs of discretionary programs.

Title IV – Nutrition represents 80% of the budget ($391 billion), Title XI – Crop Insurance 8% ($41 billion), Title II – Conservation 6% ($28 billion), Title I – Commodity Programs 5% ($24 billion) and the other titles 1% ($5 billion). Risk management programs including the management of safety nets are financed by 13% of the 2014 farm bill budget and 66% of the $98 billion budget excluding the food programs of Title IV. The budget for supporting crop insurance is about twice as much as the budget for the commodity programs (Figure 5).

The CBO has estimated the spending of the continuation of the 2008 Farm Bill for five years and drawn a baseline[21] for comparison with the expected spending under the 2014 Farm Bill. Using this baseline, the 2014 Farm Bill presents a total reduction of spending of $5.3 billion over a five-year period, or about $1billion per year. Figure 4 illustrates the changes in direct spending for each title of the bill.

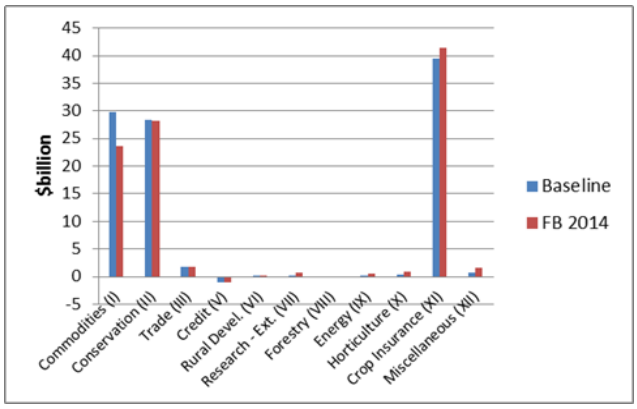
[21] CBO baselines are in fact for ten year budget windows even though programs only run for five years.

Figure 4: Estimated changes in spending of the 2014 farm bill relative to the baseline - Fiscal Years 2014-2018 (Billion $)



Source: from Table 2, CBO 2014.

Figure 5: Estimated levels in spending of the 2014 farm bill relative to the baseline - Fiscal Years 2014-2018 (Billion $) - except Title IV - Nutrition



Source: from Table 3, CBO 2014.

Most of the reduction in spending is due to commodity programs in Title I (- $6.33 billion) and nutrition in Title IV (- $3.28 billion) but the decrease is 21% in Title I and just 1% in Title IV. Most of the increase in spending is due to crop insurance in Title XI (+ $1.83 billion). This absolute increase of 5% should not hide the strong relative development of budget for several titles: +2100% for Rural Development in Title VI, +690% for Research and Extension and +675% for Energy in Title IX.

The major changes in the 2014 Farm Bill are therefore related to commodity programs and crop insurance. More precisely, within the commodity programs, the repeal of $4.5 billion of annual direct payments to farmers is "*saving*" $18 billion in four years (no direct payments for the 2014 crop year). If we consider the PLC program is replacing the Countercyclical Payments, the net change is an additional spending of $4.6 billion (+ $5.1 billion for PLC minus $0.5 billion for CCPs). Again, if we consider the ARC program is replacing the ACRE program, the net change is an additional spending of $4.0 billion (+ $6.5 billion for ARC minus $2.5 billion for ACRE).

Within the crop insurance title, the two new programs should increase the budget spending, starting in 2015, with $0.5 billion for SCO and $1.1 billion for STAX. Small budget changes are estimated for the rest of the insurance programs with respect to the $41 billion budget of the title.

3. THE CASE OF THE EUROPEAN UNION

KEY FINDINGS

- The CAP moved from agricultural market support to farm income support through a series of reforms starting in 1992. The 2003 reform created the basic instruments of this new policy.
- The repealing of market support induced an increase in domestic price volatility. With an observed and foreseen increase in production risks due to adverse climatic and sanitary events, but also due to EU rules related to healthy food, environment, biodiversity and climate change, farmers are dealing with an increasing income risk.
- Farm income support for the period 2014 – 2020 is provided by Direct Payments (DP), decoupled from production. It is the main instrument offered by the CAP consuming 72% of the CAP budget[22]. The income support mechanism will be more targeted than previously with a new system of multi-purpose payments, including a Basic Payment Scheme (BPS) and a "greening component" for supporting practices beneficial to the climate and the environment.
- Theoretically, farm risk management in the CAP 2014-2020 is provided through commodity programs to stabilize markets against major price disturbances (Pillar 1) and risk management programs (Pillar 2).
- In reality, the current CAP's risk management policy is very weak.
- Commodity programs are limited in terms of target price for intervention, measures against major disturbances have no defined triggers or means, and the current financial reserve is relatively small compared to the risk assessment
- Risk management programs are treated more as concepts than as real tools. Their development since 2009 has been very limited through individual MS actions. The major innovation of the CAP 2014-2020, the Income Stability Tool, looks problematic for future development.

"*The Common Agricultural Policy (CAP) is designed to deliver a sustainable agricultural sector in Europe by enhancing its competitiveness, ensuring an adequate and secure food supply, preserving the environment and countryside while providing a fair standard of living for the agricultural community*" (EC 2011, p. 15)

3.1. Historical trend of risk management tools in the EU

The CAP reform in 1992 and later Agenda 2000 started a major change in the support mechanism of European agriculture. In the context of the Uruguay Round and later the WTO, the historical commodity programs based on guaranteed target price and market isolation from the rest of the world price intervention were essentially dismantled and

[22] Computed as DP/(EAGF+EAFRD) in 2014-2020 Multiannual Financial Framework EU-28 (EP Fact Sheets, 2014) http://www.europarl.europa.eu/RegData/etudes/fiches_techniques/2013/050210/04A_FT(2013)050210_EN.pdf It corresponds to 71% for the ratio DP/(Heading 2 budget).

transformed into the current minimum safety-net system with low target prices for some limited products. As a consequence, domestic EU prices decreased and converged towards international prices. The short-term and long-term price volatility increased within the EU markets.

Compensatory payments for price decreases, linked to current production, were provided to farmers in order to support their income. The CAP was then market-oriented with new policy tools dedicated to directly support farm income. The promotion of rural development started in the early 2000's with a distinct CAP organization into two "pillars": Pillar 1 dedicated to commodity programs and "*compensatory*" direct payments and Pillar 2 dedicated to rural development and the environment.

In January 2001, the European Commission published the very first analysis of risk management tools for EU agriculture (EC 2001), explaining the need for such tools under the new CAP orientation, covering the description of finance and insurance methods and instruments, the potential justification and means of public policy, lessons from risk management policies in various countries around the world and concluding on potential fields of action for the EU. In order to reduce fluctuations of income or its components, the document concludes on three issues and related pertinent tools, price risk, production risk and counter-cyclical income measures.

The **2003 CAP reform** was a clear re-assessment of the political orientation of the CAP, (i) a market-oriented agriculture where prices provide the economic signals for production and consumption, (ii) a sustainable agriculture based on rural development, agri-environmental and ecological measures as well as animal welfare. Regulation 1782/2003 established a single payment scheme that combined the existing various support mechanisms into a single scheme of decoupled direct payments (DP) to farmers. These DP were linked, under the so-called cross compliance system, to requirements in the areas of plant and animal health, animal welfare and agri-environmental measures.

The 2003 CAP reform started a complex system to balance the financing of DP in Pillar 1 and the financing of the expanding rural development programs in Pillar 2. The terms of "*modulation*" and "*financial discipline*" cover the principle of "*communicating vessels*" under the ceilings of the CAP pillars. Financing a new measure in Pillar 2, or in Pillar 1 for risk management tools, required a decrease in the value of the DP. A budgetary discipline mechanism was applied to keep expenditure on the first pillar of the CAP below the annual budget ceilings set within the multiannual financial framework (MFF). An adjustment to the direct payments could be proposed when projections indicate that the total forecast expenditure exceeds in a given financial year.

For instance, Article 69 in Regulation (EC) 1782/2003 allows MS to use 10% of the aid provided under Pillar 1, mainly DP, for financing agri-environmental measures and measures to support quality, marketing and food chain improvement. This article gives the possibility to support crop insurance programs financially with various practical constraints on rates of subsidy and compensation.

Following a demand from the Council (Council Decision 2003, p.2) to update an inventory of risk management tools available in MS and to present "options" for new developments of the CAP under three basic constraints, the WTO rules, no distortion of competition within the common EU market and within the financial EU stability commitments in place, the Commission provided a communiqué in March 2005 on risk and crisis management in agriculture (EC 2005). It is first stated that "*income stabilization is now largely provided by*

the new system of decoupled payments" (p. 5). As a result, the "*Commission does not intend to propose the general introduction of safety net clauses to each common market organization*" as was done for the beef industry in 1974.

It is then proposed that any additional risk and crisis management measures be co-financed in the second pillar of the CAP using points of modulation under the principle of annuality that forbids MS to retain funds for the purpose of distributing them in later years.

Three "new" options for risk management within the CAP are suggested for further developments in this **2005 Commission communiqué:**

1. **subsidizing insurance premiums against natural disasters;**
2. **supporting mutual funds for compensating severe farm income losses;**
3. **providing basic coverage against income crises.**

The options are clearly designed to respond to catastrophic production or income loss, in other words with crises, and comply with the green box of the WTO rules.

It is worthwhile to quote a comprehensive study financed by the European Commission after the 2005 Communiqué in order to progress on the potential efficiency and feasibility of the three proposed options. The study covers an EU agricultural risk assessment and inventory of MS risk management tools with a special focus on crop and livestock insurance (Bielza et al. 2006, modified 2008). Although the study provides useful information on the current state of the art among MS in terms of agricultural insurance (in particular an increasing relationship between public concern and geographical southern latitude), the conclusive chapter on scenarios for designing an EU-wide insurance system is tentative at best. Areas of further research are recommended by the very diversified group of experts that conducted the study. The Income Stabilisation Project supported by the EU has also brought important results on risk management policies within the MS (Garrido et al. 2008, Meuwissen et al. 2008).

The implementation of the 2003 CAP reform was "*checked*" in 2008 in order to design adjustments and improvements of the policy measures. A political agreement within the Council was then reached in November for improving the CAP in its market orientation while facing additional challenges, such as loss of biodiversity, climate change, water scarcity and drought, demand for bio-energy.

The **2008 CAP "*Health Check*"** agreement was translated into three Council Regulations:

- regulation (EC) No 72/2009 for adjustments in commodity programs under the CMO (intervention system for different productions, expected end of quota systems for milk and sugar);
- regulation (EC) No 73/2009 establishing common rules for direct income support schemes; and
- regulation (EC) No 74/2009 on support for rural development by the dedicated fund (EAFRD).

Under the CAP "*Health Check*", the risk management issue was developed in the regulation (EC) No 73/2009 through recital (n° 35) and three articles under the title "*Specific support*" with explicit measures for "*option 1*" and "*option 2*" that could be financed by a fraction (10%) of the national ceiling for the SPS (Art. 68).

"*Given the growing importance of the effective management of risks, MS should be given the option to contribute financially to the premium farmers pay for crop, animal and plant insurance as well as to the financing of compensation for certain economic losses in the event of animal or plant diseases and environmental incidents. With a view of respecting the Community's international obligations, the resources that could be used for any coupled support should be limited to an appropriate level …*"

Article 68 states the general rules of "*specific supports*", as a part of the general "*Income Support Scheme*", scope of the regulation.

> "*MS may grant specific support to farmers:*
>
> *a) for*
>
> *i. specific types of farming (… to the benefit of environment)*
>
> *ii. improving the quality of agricultural products*
>
> *iii. improving the marketing of agricultural products*
>
> *iv. practicing enhanced animal welfare standards*
>
> *… / …*
>
> *d)* ***in the form of contributions to crop, animal and plant insurance premiums***
>
> e) ***by way of mutual funds for animal and plant diseases and environmental incidents*****"**

Article 70 provides the **conditions of public support for insurance premiums related to crop, animal and plant diseases**.

- loss caused by a 30% decrease in production with respect to a three-year period (or an Olympic average);
- maximum subsidy of 65% of the insurance premium, 25% being financed by the MS and 75% co-financed by the Community;
- formal recognition by the competent authority of the MS of an adverse climatic event, outbreak of an animal or plant disease;
- subsidy paid directly to the farmer concerned.

Article 71 provides the conditions of public support to **mutual funds** providing compensation to affiliated farmers for losses due to animal and plant diseases as well as environmental incidents.

- maximum subsidy of 65% of the insurance premium, 25% being financed by the MS and 75% co-financed by the Community;
- Member States shall define the rules for the constitution and management of the mutual funds, in particular for the granting of compensation payments to farmers in the event of crisis and for the administration.

The article on mutual funds does not require a 30% decrease in production compared to some average level or a formal recognition of the outbreak of animal or plant disease, or environmental incidents. But considering the general framework of the emerging EU policy on agricultural risk management, these constraints could be considered as implicit.

The "*Health Check*" was therefore the opportunity for the Commission to design for the first time the main features of the instruments for agricultural risk management that will be supported by the CAP. Considering the three options proposed in 2005:

- "*option 1*" looks well described through various percentages qualifying for public support. However, there is no measure to cope with reinsurance or co-insurance which are fundamental issues for the development of insurance contracts to cover risks with a high systemic component (drought in the South of Europe or some contagious animal diseases for instance);
- "*option 2*" is moving towards mutual funds designed for compensating production loss due to adverse events, natural or accidental rather than whole-farm income losses. Surprisingly, climatic events are not quoted as triggers for compensation;
- "*option 3*" is not implemented.

The outcome of the CAP risk management measures as projected in the 2003 Reform and designed a few years later in the regulations of the 2008 CAP "*Health Check*" is **very limited**.

First, the insurance subsidies declared by the EU to the WTO in 2011-12 (WTO, G/AG/N/EU/20 2014) were for relatively small sums: about €30 million in the Green box and €419 million in the Amber box as "non-product-specific outlays". The Green box concerns some national income insurance programs in the Czech Republic, and also in Spain, Slovenia and Estonia for minor amounts. The Amber box amount comes mainly from Spain, Austria, Poland and Italy and for minor amounts from Bulgaria, Latvia, Lithuania, Luxembourg, Portugal, Romania, Slovakia and Slovenia[23].

Additionally, the subsidies which are considered as "*support*" under Article 69 and later Article 68 must be added–to the aforementioned declarations. A limited part of direct payments is diverted into **insurance subsidies** under rules compatible with the Green box. Even though it is difficult to estimate such transfers of direct payments towards subsidies to production insurance in the EU under Article 69, it is known that few MS were taking advantage of this possibility in 2008 (Bielza et al. 2008) and few MS used Article 68 in the period 2008-13[24].

France, for instance, is still declaring its insurance subsidies (€100 million) as market support and will continue to do so up to 2014. Compared with the estimations of loss due just to climatic events within the EU, this level of public spending is very limited.

The Rural Development Program prepared in France for the Commission is estimating severe losses of national agriculture due to climatic events at more than €1.2 billion per year, or 2% of the agricultural crop value. An extrapolation of the annual average indemnities paid by crop insurance after deductible gives an estimation of loss of €900 million for insured crops. The €118 million in indemnities paid by the national mutual fund for non-insurable severe climatic events leads to an estimation of an additional loss of €350 million per year.

[23] Unofficial source.

[24] The European Court of Auditors report (2013) indicated that France and Italy used Article 68 to subsidize crop insurance. A previous Commission Staff Working Paper (EU 2011b) indicated that three MS have notified their intention of using insurance subsidies in the framework of Article 68 for 2010 (France, the Netherlands and Italy).

The development of **mutual funds** dedicated to climatic and sanitary events within the MS is also very limited. During the International Conference on Risk Management in Madrid in June 2010, Mrs Carina Felgerson, DG, stated that just one MS had notified the EU about the creation of a mutual fund. Considering two MS already had mutual-fund type organizations since the sixties (France) and the seventies (Italy) for dealing with climatic risks and financed by former State subsidies, the Commission's proposition did not create a deep movement within MS.
The process of designing adequate CAP measures for farm risk management within the 2003 CAP context came to a new level of development with the tripartite EU agreement (Commission – Council – European Parliament) in 2013, ten years later.

3.2. The CAP 2014-2020

3.2.1. General scope: risk management tools vs rural development policy

The CAP 2014-2020 is a result of an agreement between the European Parliament, the Council and the Commission. The CAP reform covers all the main instruments in four regulations[25] of the European Parliament and of the Council of 17 December 2013:

- Regulation (EU) No 1305/2013 for support for rural development by the EAFRD;
- Regulation (EU) No 1306/2013 on the financing, management and monitoring of the common agricultural policy;
- Regulation (EU) No 1307/2013 establishing rules for direct payments under support schemes within the framework of the common agricultural policy;
- Regulation (EU) No 1308/2013 establishing a common organization of the markets in agricultural products.

The CAP 2014-2020 has clearly positioned risk management measures into rural development, therefore in Regulation No 1305/2013, and no longer on farm income support as was previously the case. The shift is clear, risk management instruments moved from the first to the second pillar. Consequently, they remain as facultative instruments for MS. This optional implementation by MS will inevitably lead to discordant development and, probably, economic distortions of this new toolkit.

Furthermore, risk management policy is marginal within the text of Regulation No 1305/2013. Quantitatively, the 67 "*recitals*" cover about 1,100 lines of text with only 37 lines on risk management issues. The risk management issue could therefore be estimated as occupying a marginal 3% of all rural development issues. Qualitatively, risk management issues do not seem to be a priority for rural development either. Recital 8, for instance, presents a list of sub-programs that MS could implement but without any reference to risk management[26]. Many issues such as "*short supply chain*" seem to be of greater importance. Recital 13 on farm advisory services include nothing on risk management when developing a list of topics such as short supply chain or organic farming.

[25] The main regulations related to the CAP 2014-2020, delegated and implementing acts as published in November 2014 are presented in Annex.

[26] Another example is the EU Rural Development Gateway which does not provide any "lessons learned", examples of RD Program implementation in risk management, or useful information to prepare any type of program in risk management.
http://enrd.ec.europa.eu/enrd-static/policy-in-action/cap-towards-2020/rdp-programming-2014-2020/en/rdp-programming-2014-2020_en.html.

Recital No 30 states that rural development measures should "*help farmers to cover premiums they pay for crop, animal and plant insurance as well as with the setting up of mutual funds for compensating losses due to climatic events, outbreak of animal or plant diseases, or environmental incidents. It should also include an income stabilization tool in the form of a mutual fund to support farmers facing a severe drop in their income*". Such measures, as stated, should be set with respect to the Green Box of the WTO rules and without distortion in domestic competition between farmers from various MS

Risk management is no longer in Pillar 1 but is not yet really in Pillar 2, aside from theoretical measures without "practical" guidelines for MS[27]. So, the EU seems to be doing the minimum to be able to claim that risk management has been integrated into the CAP. **"Optional" and "unpractical" measures in Pillar 2 almost guarantee the absence of an immediate future for the risk management tools supported by the CAP.**

The general articles of Title I of the regulation related to the mission, objectives and priorities of rural development state that policy instruments in the second pillar should complete other instruments of the CAP through the development of a rural sector which is "*more territorially and environmentally balanced, climate-friendly and resilient, and competitive and innovative*". Risk management is quoted in the Union's priorities for rural development in Article 5 as part of Priority 3 "*promoting food chain organization including processing and marketing of agricultural products, animal welfare* ***and risk management in agriculture****, with a focus on the following areas:*

a) *quality schemes, promotion in local markets and short supply circuits …*
b) ***supporting farm risk prevention and management".***

The need for risk management measures is therefore stated in just two of the over–eighty lines of priorities for rural development.

Title II of the regulation develops the programming of rural development for the CAP 2014-2020 but thematic sub-programs listed in Article 7 do not specify risk management instruments as examples and Article 15 on support to farm in Article 15 advisory services has no word on such issue. Article 29 on organic farming mentions no specific risk management needs.

Articles 36 to 39 present the measures related to farm risk management. Article 36, equivalent to Article 68 in 73/2009, is general on risk management. The three following articles deal respectively with crop, animal and plant insurance (article 37), mutual funds for adverse climatic events, outbreaks of animal or plant disease or environmental incidents (article 38) and an income stabilization tool in the form of financial contribution to mutual funds (article 39)

In conclusion, considering the major transfer of price risk from the public sector to the farmers defined by the 2003 CAP reform and the delay to analyze potential risk management tools, individually or in combined methods, the 2009 regulation should be

[27] Commission Delegated Regulation (EU) N° 807/2014 (OJ L 227, 31.7.2014) confirms the "attribution" of the design of the Rural Development measures in general to member States. But only one article of the Delegated Act (art. 12) is dedicated very marginally to the mutual funds. In addition, the Implementing Regulation (EU) N° 808/2014 (OJ L 227, 31.7.2014) does not develop any risk management provisions.

considered as a major step in the related policy design. Five years later, the 2014 regulation should demonstrate a "*mature*" state of said policy. It does not.

3.2.2. What is new in the Regulation (EU) No 1305/2013?

First, it is important to consider the improvements and adjustments provided by the latest regulation compared with the first step of development.

As already noted, **the head title of articles** related to the CAP risk management instruments **changed positively from "*Specific support*" to "*Risk management*" measures.**

Article 36 (1305/2013) defines the risk management measure under three titles:

a) financial contribution to insurance premiums;
b) financial contribution to mutual funds dealing with climatic, sanitary events and environmental incidents;
c) financial contribution to mutual funds dealing with severe drop in farm income as an Income Stabilisation Tool (IST).

The first major change, improvement or adjustment, **is the scope of the mutual fund (second title)** dedicated to production risks **that now may include climatic events. The second one is the income stabilization tool presented under a mutual fund scheme.** The mutual fund scheme and scope receive a short description in the article.

The last sentence of the article requires a report from the Commission on the implementation of the risk management measure by **the end of 2018**, at the mid-term evaluation of the CAP reform and 15 years after the fundamental 2003 CAP reform.

Article 37 (1305/2013) is nearly identical to Article 70 (73/2009) except for the possibility to use index to estimate individual farmer production losses. Article 37(1) states that "*index may be used in order to calculate the annual production of the farmer. The calculation method used shall permit the determination of the actual loss of an individual farmer in a given year*". Biological index and weather index are thus defined. "*Equivalent yield loss indexes established at farm local, regional or national level*" should represent production loss for groups of farmers at an administrative scale (communes, counties, etc.).

Such improvement is **crucial for insurance policies**. First, it is a mean to by-pass the "*moral hazard*" issue, one of the two basic economic problems of the sector. It allows production insurance with low deductible covering shallow losses. Second, it is a technique that can decrease the cost of expertise for loss evaluation. However, there is also a well-known limit of index insurance: the basis risk related to the limited correlation between the individual loss and the "*average*" loss indicated by the index that may induce adverse selection and later jeopardize the index-based policy.

No cross-compliance scheme is provided (established), either in prevention methods or in ecological-environmental measures. Prevention methods may however be part of the general items of the insurance contract with premium discounts as incentives.

Article 38 (1305/2013) extends the scope of the **mutual funds** to losses due to climatic events as compared to Article 71 (73/2009). In addition to this major change, it is also

stated that index may be used in order to calculate the annual production and therefore the actual loss of an individual farmer. No particular details are provided on the types of indexes, so the implicit reference should be given in the previous article of the regulation[28]. No cross-compliance scheme is provided (established), either in prevention methods or in ecological-environmental measures.

Article 39 (1305/2013) has no equivalent article in the previous regulation. The **Income Stabilisation Tool (IST)** proposed is basically a mutual fund (excluding the possibility of any insurance scheme[29]) for compensating farmers for severe income loss. It is quite a new concept in the CAP regulation even though somewhat related to the "*option 2*" of the Commission's 2005 Communiqué, "*supporting mutual funds for compensating severe farm income losses*" and to some past concepts included in a proposed stabilizing fund for pig producers (2000) that was never really implemented.

The public contribution to the mutual fund is granted for a 30% income loss on a past three-year average (or an Olympic five-year average). The contribution is fixed at a maximum of 65% of the eligible costs which are defined in terms similar to article 38(3). Payments by the mutual fund to farmers are limited to 70% of the income loss.

Farm income is defined in Article 39(1) (for the first time in an EU regulation) as "*the sum of revenues the farmer receives from the market, including any form of public support, deducting input costs*". Input costs are not clearly defined but, reasoning with ~~a~~ fixed units of production, hectares or livestock, and fixed acreage, it is possible to aggregate variable and fixed costs per unit of production into "*total costs*".

As a result, it is possible to simulate various farm situations of total costs as a proportion of total revenues and estimate the trigger values of income parameters that may create a 30% income loss. Table 4 indicates that an income loss may come from a market revenue decrease of 19% if the input costs are equal to 50% of farm revenue including direct payments to a 4% decrease if the input costs are 90% of farm revenue. Market revenue per unit of production is the product of price time yield with a theoretical negative correlation between the variability of prices and yields. But the negative correlation between the price reference and local yields is not significantly stable as prices are set on a very large international basis when yields are affected by local weather conditions.

[28] Again, Delegated and Implementing Acts published in 2014 do not provide any additional information or clarification.

[29] Even though whole-farm income insurance schemes (AGR and AGR-Lite) have no current commercial success in the US, index-based income insurance could be envisaged. The problem of designing a farm income proxy index is more important to resolve than the choice of the adequate instrument of income risk management: mutual fund or insurance policy.

Table 4: Simulation of price or yield decrease to induce a 30% income loss with direct payments

Market revenue (PxY)	80				
Direct payment	**20**				
Total revenue	100				
% Costs/total revenue	50%	60%	70%	80%	90%
Income	50	40	30	20	10
Market revenue decrease with 30% of income loss	**19%**	**15%**	**11%**	**8%**	**4%**

Source: Author.

The income decrease may come from a price or a yield decrease of 15%, or a combination of both with a proportion of 60% of total costs. It may also come from an input value increase, in terms of quantity used). This table illustrates the difference of scale for market triggers for compensation between mutual funds dedicated to production and income risks. If the direct payment as a proportion of market revenue is decreasing, triggers for financial compensation are still lower, as illustrated in Table 5.

Table 5: Simulation of price or yield decrease to induce a 30% income loss without direct payments

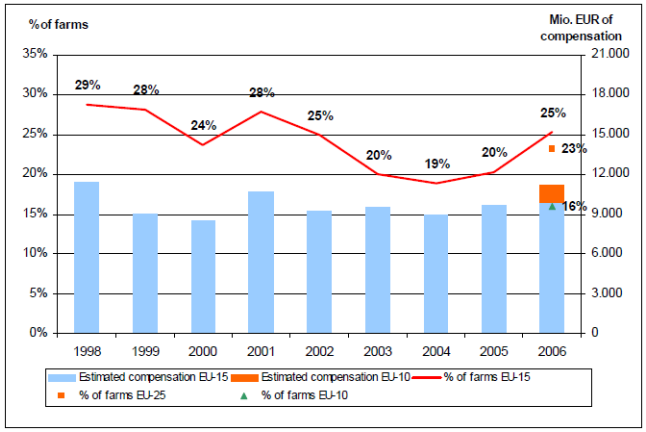
Market revenue (PxY)	100				
Direct payment	**0**				
Total revenue	100				
% Costs/total revenue	50%	60%	70%	80%	90%
Income	50	40	30	20	10
Market revenue decrease with 30% of income loss	**15%**	**12%**	**9%**	**6%**	**3%**

Source: Author.

The EU Commission (EC 2009) tested, using FADN data, the concept of a "*free*" income insurance policy that would compensate 70% of a 30% minimum income loss due any reason, output price and/or yield decrease, input price and use increase. The loss is computed on historical incomes. Under computation hypothesis and use of farm income proxy, 23% of the EU-25 farmers in 2006 had an estimated loss greater than 30% with a required compensation of $11.2 billion (€9.7 billion per year as an average for the last decade, EU-15 and variations from €8.5 to 11.4 billion), as illustrated in Figure 6[30].

[30] Such estimations are also provided by the Commission (EC 2011b) when comparing the options of (i) extending the current framework for insurances and mutual funds, (ii) creating an Income Stabilisation Tool or (iii) a dedicated crisis fund (called "*Global Agricultural Risk Management Fund*").

Figure 6: Share of farms "eligible" for compensation and budget needed for 70% compensation



Source: DG AGRI EU FADN in EC 2009.

Considering the high probability of income loss to be compensated, commodity by commodity and even at the whole-farm level, the dimension (probability of adverse event occurrence as well as average financial loss) of the proposed IST is totally different from the two other ones, subsidy to crop insurance and mutual funds on production risks. It is a major potential instrument for farm risk management that is proposed with a minimum of positive guidelines.

3.2.3. Regulation No 1306/2013: financing, management and monitoring of the CAP

In Article 25, the regulation creates a new **reserve for crises** in the agricultural sector. The level of the reserve is set at €400 million (in 2011 prices) using deductions from direct payments, with unused payments reimbursed to farmers in the consecutive budget years. As a consequence, the maximum amount of the reserve each year will be the reevaluated €400 million and not the €2,800 million on the seven-year period 2014-2020 which is sometimes (erroneously) asserted. Article 25 does not provide any operational mechanism for providing support to markets and/or to market participants. The first experience of using the reserve described in Box 3 to "compensate" the adverse effect on the Russian embargo highlights the need to design such mechanisms within the regulation of the CMO.
The establishment of Farm Advisory System in MS is also required in Article 12. The system "*shall cover at least*" obligations of statutory management requirements and standards for good agricultural and environmental conditions of land, the agricultural practices for the climate and the environment and measures for farm modernization, competitiveness, innovation, market orientation and entrepreneurship. The system "*may also cover*" a) the promotion of conversions of farms, the diversification of their economic activity, b) "*risk management and the introduction of appropriate preventive actions to address natural disasters, catastrophic events and animal and plant diseases*", c) the minimum requirements set by MS laws on agri-environment-climate and organic farming measures and d) the information related to climate change mitigation, biodiversity and protection of water.

3.2.4. Regulation (EU) No 1307/2013: direct payments

This regulation develops a new direct payments scheme designed to be "*better targeted, more equitable and greener*" (Tropea 2014). The Single Payment Scheme (or Single Farm Payment) introduced in 2003 provided generic farm income support. Regulation (EU) No

1307/2013 creates a system of multi-objective payments with two main components: a basic payment per hectare (BPS for Basic Payment Scheme) to support farm income subject to a convergence process among and between MS and a "greening" component to compensate for the costs of providing environmental public goods. Other payment components are more specific and related for instance to young farmers, areas with specific natural constraints or support for production for economic and social reasons.

The BPS is mandatory for all MS and should represent 70% of their direct payments national envelope, after deduction of any amounts committed for young farmers measures (also mandatory up to 2% of the national envelope) and other components (which are not mandatory).

In addition to the BPS, farmers will receive a "*greening*" payment per hectare for implementing measures favorable to environmental and climate. Such measures are mainly crop diversification (on-farm risk management measure), maintaining permanent grasslands and an "ecological focus area" such as field margins, hedges, trees, fallow land, biotopes, buffer strips, afforested surfaces or nitrogen-fixing crops. The MS "*greening*" payment is mandatory and should represent 30% of the national envelope.

The regulation is technical for describing direct payment distribution to farmers, including the possibility to transfer up to 15% of the MS ceiling to pillar 2 for rural development objectives, as presented in regulation 1305/2009. A large part of the text is devoted to ensure that direct payments will comply strictly with the financial budget and rules of the CAP.

When the initial SPS was a generic farm income support, the CAP 2014-2020 is now looking for farmer compensation for production costs of public goods[31] that are not remunerated by the market (the mandatory "*greening*" payment). The CAP regulation is also targeting specific public policies, such as income support in areas with specific natural constraints or income support for social reasons. The objectives of income support are now better defined and disconnected from the initial and now obsolete objective of compensating price decline due to EU market deregulation. However, from 60 to 70% of the direct payment envelope (or 43 to 50% of the CAP budget) is still provided as a generic income support without clear long-term objectives. On a positive note, it is not specifically stated in Regulation (EU) No 1307/2013 that direct payments are part of the risk management toolbox of the CAP.

3.2.5. Regulation (EU) No 1308/2013: Common Organization of the Markets (CMO)

This regulation is the longest text of the four EU regulations (1305 to 1308/2013): 190 pages against 61, 56 and 62 pages. It contains first the "*commodity programs*" that create a safety net through historical tools such as public intervention, private storage and export refunds for some agricultural products but at levels supposed to be exceptional. It also presents a list of aid schemes to various sectors sometimes with a mix of *ex-post* measures not defined quantitatively and few (surprising) limited risk management tools such as insurance and mutual funds, for fruits, vegetables and wine.

Recital 10 introduces the historical EU commodity program of "*market stabilization*" to ensure a fair standard of living for the agricultural community whereas Recital 45

[31] The environmental and climate measures may also been considered as good private agricultural practices for farm sustainability.

introduces "*preventive instruments*", such as harvest insurance and mutual funds, "to encourage a responsible approach to crisis situations.

Regulation (EU) No 1308/2013 is divided into six parts dedicated respectively to (1) introductory provisions, (2) internal market (market intervention and specific provisions for individual agricultural sectors) , (3) trade with third countries (including export refunds), (4) competition rules, (5) general provisions (for exceptional measures against market disturbance) and (6) delegation of power and implementing provisions. Even though all parts have an impact on market behavior, trade and producers organization within competition rules, parts 2 and 5 directly design the safety net programs for the EU agricultural markets.

Within the second part, on the internal market, the first chapter deals with public intervention and aid for private storage. Article 7 for instance provides threshold prices for cereals, paddy rice, white and raw sugar, beef and veal, butter and milk powder, pig carcass, olive oil whereas Article 11 lists the products eligible for public intervention and article 17 the products eligible for private storage. Chapter 2 deals with aid schemes to various sectors (olive oil, fruits and vegetables, wine, apiculture and hops). Operational programs and funds are specified for crisis prevention and management in the fruit and vegetables sector in **Articles 32 and 33**, including harvest insurance. Mutual funds and harvest insurance are specific titles of **Articles 48 and 49** for the wine sector. Support to mutual funds, "*to assist producers seeking to insure themselves against (*price*) market fluctuations*", is limited to set-up costs. Harvest insurance "*shall contribute to safeguarding producer's income*" against natural disasters, adverse climatic and sanitary events. Specific regulations for subsidies are provided.

Part five deals with general provisions for **exceptional measures** against market disturbance. Such measures may cover market withdrawal and free distribution, private storage, promotion, specific production and quality requirements. Article 229 explains that "*the Commission shall be empowered to adopt delegated acts to take the measures necessary*" … "*to react efficiently and effectively against threats of market disturbance*". Notably, eight delegated and implementing acts were published in August and September 2014 for dealing with market disturbances on the European dairy, fruit and vegetable markets due to the Russian embargo (see Annex).

Urgency procedure is available for immediate action. The Commission may ask a committee of experts to assist in the management of exceptional measures. Among sources of market disturbance, article 220 specifically targets the spread of animal disease and loss of consumer confidence due to "*public, animal or plant health and disease risks*".

Article 226 states that the reserve for crisis in agriculture may be used during "*circumstances that go beyond normal market developments*" for price intervention, export refunds and the exceptional measures of the current part.

As stated in the Guidance Fiche 17.1 of Regulation (EU) No 1305/2013, "*a variety of CAP instruments should contribute in a complementary way to attenuating the risks of agricultural production through market measures available under the single Common Market Organization, direct payments and the EU's rural development policy*". This statement can be questioned with respect to the role of the direct payments but it also indicates that risk management is still, in a very limited way, in Pillar 1 when it is supposed to be developed in Pillar 2. It is also clear that risk management instruments cannot be

structured with safety nets by a coherent policy as the latter are now mostly tailored *ex post* payments without clear triggers and rates of objective coverage.

4. APPLES AND ORANGES? COMPARING US AND EU RISK MANAGEMENT POLICIES

KEY FINDINGS

- The US is following a clear trend to develop ex-ante risk management instruments linked with safety net programs. The RMA is permanently developing instruments, in collaboration with the private sector, to reduce farm income distribution and truncate its left-tail. The FSA is providing counter-cyclical programs to compensate price or revenue losses with respect to fixed or adaptive triggers. Risk management instruments and safety nets are linked using parameter values, such as individual or area-based triggers, in the search of efficiency.

- The EU CAP policy is mainly based on fixed direct payments that increase farm income level. Safety net measures moved from the "old" traditional measures of price intervention and aid for storing "excessive" supply to "new" ad hoc measures in case of strong market disturbances. Risk management instruments are in a state of limbo after a decade of studies, proposal of options and preliminary regulations in 2005 and later 2009. As a consequence, there are few links between evanescent traditional safety net measures–and undefined (uncharacterized) measures to cope with market disturbance and risk management proposals.

- The US budget is flexible and assumes to a large extent the financial implications of risk management as well as safety net instruments while the EU budget is fixed and constrained by the MFF. The flexibility required for managing random events did, however, lead to the creation of a contingent financial reserve to cope with exceptional events. The reserves are, however, limited in size and constrained in their practical use.

The 2014 Farm Bill and the CAP 2014-2020 demonstrate two trends in public policy towards agriculture and farmers. In the **US**, risk management of farm income is a primary concern with little importance given to direct farm income support. In the **EU**, farm income support seems to be the main goal with a simple "*willingness*" to develop risk management tools. Both agricultural policies are developing safety nets against market crisis and catastrophic production events. In the **US**, safety nets have common parameters with risk management tools for most of the agricultural products. In the **EU**, on the other hand, such safety nets stand as exceptional measures with no links to current *ex-ante* risk management instruments of the private market.

4.1. Relative US-EU weights on risk management, safety nets and direct income support programs

The priorities of public policies can be checked by evaluating program development in agricultural **laws** (Table 6) and **related budgets** (Table 7).

The **2014 US Farm Bill**, like the previous one in 2008, presents safety net programs in a specific title (Title 1) and main risk management instruments in another specific title (Title

XII). Indirect measures linked with the previous instruments, such as international trade or credit, are presented in other titles, including Title XIII – Miscellaneous.

The **EU agricultural policy** is developed in four main regulations, where two of them are dealing with risk management and safety nets. Basically, Regulation (EU) No 1308/2013 presenting the Common Market Organization for agricultural products handles–safety net programs under a set of dedicated articles adjusted per type of commodity. Regulation (EU) No 1305/2013, presenting programs for rural development, has a general article to emphasize the need for risk management measures among (and after) a dozen of other objectives and priorities. Four articles dedicated to risk management instruments develop the framework for supporting potential tools that the private sector within MS could implement. A third basic act, Regulation (EU) No 1307/2013, is dedicated to direct payments with developments on greening segmentation and convergence within and among MS (Table 6).

Table 6: Estimated length of dedicated "text" within agricultural public policy laws

	US	EU
Risk management support	60%	1%
Safety nets	40%	39%
Income support	0%	60%

Source: Author.

Concerning the financial issues, the US Congress voted a $96 billion annual budget[32] for the 2014 Farm Bill with $76 billion (80%) for consumer programs and $19 billion (20%)[33] for farmer programs. The expected spending is mainly dedicated to crop insurance programs as risk management tools, making up 47% of total farmer programs spending. The expected budget of safety net programs, counter-cyclical programs based on fixed price triggers or adaptive revenue triggers for main crops on the one hand and disaster payments for specialty productions including livestock on the other hand, is estimated to be 23% of the farm programs total spending (Table 7)[34]. Fixed direct payments have been eliminated.

The EU Multiannual Financial Framework (MFF) 2014-2020 provides €53 billion per year for Heading 2, "*Sustainable growth: natural resources*" of which €40 billion per year is devoted to market-related expenditures and fixed direct payments and €12 billion to support–rural development (Little *et al.* 2014). Direct payments account for 95% of the EAGF funding, or €37 billion per year while–safety net programs, 4% of the EAGF funding, may be estimated at €1.7 billion per year (Massot 2014). The €400 million reserve from direct payments may also be used for compensating losses to specific market disturbances. Risk management tools as described in the Regulation (EU) No 1305/2013 should be co-financed by MS (25%) and the EAFDR (75%). The 2014 EU budget for such instruments should be considered at a maximum of €200 million.

[32] The budget is estimated by the CBO for a ten-year period. The "*annual*" budget is computed for the current note as the ten-year expected spending divided by ten.
[33] Total budget minus the spending from Title IV (- Nutrition).
[34] Conservation programs are almost the complement with 28% of the budget.

If risk management policy is not improved for the period 2014-2020, the related budget would be close to 0% of the CAP budget and 1 to 2% of the EAFDR budget (Table 7).

Table 7: Estimated budget weights of programs within agricultural policies

	US	EU
Risk management support	47%	1%
Safety nets	23%	5%
Income support	0%	72%

Source: Author.

4.2. American action versus European suggestion

This section emphasizes **the incommensurable difference between technical risk management programs in the US,** "*half*" of the agricultural policy that have been developed for about thirty years, **and EU projects,** that were initiated five years ago under constrained economic principles and marginally adjusted in the CAP 2014-2020.

4.2.1. Risk management is technical - Principles alone are not enough

The US crop insurance programs are grounded on documents, general and specific provisions, which **precisely define the policies, the definition of terms, the units of production covered, the insurable acreage, the characteristics of crops, condition of planting and production, requirements on crop information (type of information and dates of transmission, requirements on keeping records), duties in the event of damage.** These documents, common of "*insurance policies*", demonstrate a precise effort not only to design a means for indemnifying losses due to market or production risks but also a very deep knowledge of practical issues of farm management and production problems. For instance, planting conditions which lead to delays are clearly specified as well as replanting payments[35].

Policy provisions, available coverage level percent, premium rates, and program dates are available on the RMA website. And farmers are aware they must keep complete records of the planting, replanting, inputs, production, harvesting, and disposition of the insured crop on each unit for three years after the end of the crop year. The information must be provided on a regular basis to the USDA and on request if necessary.

The EU risk management projects are described through conditions of public financial support in four dedicated articles among ninety in the latest (and most developed) regulatory framework:

1) Subsidies on crop insurance may be granted for heavy production losses. Some EU countries have then supported their domestic insurance market using this opportunity to extend participation of farmers in a pro-active risk management strategy. France for instance took advantage of this opportunity to accelerate its shift from limited crop insurance (hail, frost) to multiple peril crop insurance, including drought for grains, that

[35] The 29 pages of RA provisions are an example of such detailed policy: http://www.rma.usda.gov/policies/2005/ra/pdf/05rabasic35.pdf.

was originally compensated by a mutual fund[36]. French insurers were able to develop a deductible buy-up scheme for offering differentiated policies in terms of rate of coverage and premium. However, the **absence of re-insurance** at a large scale, private or public, prevented insurers from developing an insurance policy for drought on pastures. Such insurance also requires the use of biophysical satellite-based index[37] that Regulation (EU) No 1305/2013 - Art 37 is just now authorizing. More generally, the absence of insurance policies in a MS because of a high systemic risk and/or absence of adequate re-insurance level at economic value, is **limiting the development opportunities of this first instrument**. For instance, drought, flood and winter frost are non-insured agricultural risks in Romania. Finally, the **proposed EU subsidies have a limited effect on crop insurance development**. The subsidies do not support countries with pure private crop insurance markets (usually with low systemic risks). They support them marginally in other countries where such systems already existed (because of low-level systemic risks). And finally, the way the EU subsidies are allocated is not efficient for countries with high systemic production risks (i.e. Spain, Austria[38] and Romania)[39].

2) Subsidies on accredited **mutual funds** may be granted for heavy production losses formally recognized by a competent authority of the MS (Article 38). MS must define the rules for the constitution and management of the funds[40]. Subsidies may partially[41] cover administrative costs of setting up the funds, the amounts paid as financial compensation to farmers and eventual interests on commercial loans installed by the funds. Again, the loss should be more than 30% of averaged past production and index may be used to "calculate" the production. "*The calculation method used shall permit the determination of the actual loss of an individual farmer in a given year*".

The principles of mutual funds for production risks are set in the regulation but without any support for implementation. There is no support on the minimum capacity for mutualisation per type of agricultural risk. Is it possible to have a mono-production mutual fund? Is it possible to have several mutual funds for the same production on the same geographical area? How should production pooling be organized? Many technical questions are local, such as risk assessment of a plant-livestock disease outbreak or climatic event, but groups of farmers willing to mutualize risks have no technical support to initiate projects and be credible for aggregating farmers on such projects. For example, it may be very useful in a country with numerous small farms and limited farm data to use production area-based index using a panel of farms or parcels. The index, by nature, will never indicate the production of individual farms perfectly. What is the tolerance authorized to the mutual funds by the EU? The business plan of a mutual fund requires a very costly technical framework when starting from scratch.

3) Subsidies may be provided to an **IST** (Article 39). Ten years of political objectives, of studies and meetings have led to only 40 lines to describe the conditions of support to a totally new concept of mutual funds providing compensation to farmers for a severe drop in

[36] Fonds National de Garantie des Calamités Agricoles (FNGCA).
[37] Such as NDVI and FCover as first index generation or FAPAR and GEMI as second generation with multispectral and multi-angular capabilities.
[38] Spain and Austria however developed national integrated insurance scheme within the EU but out of the provisions of Article 68 of Regulation (EU) No 73/2009 with dynamic features in policy development supported by public re-insurance.
[39] Including revenue insurance with a large systemic price risk.
[40] However, the Delegated Act 807/2014 as well as the Implementing Regulation (EU) 808/2014 do not provide any support for mutual fund implementation. In addition, the measure fiche provided to MS by the Commission, which is supposed to provide guidelines for implementation, contains not an additional word on the text of Article 38.
[41] 65% of the compensation and other expenses shared between the EAFDR (75%) and the MS (25%).

their income but excluding a potential insurance scheme on farm revenue or income. Conditions are like the mutual funds for compensating loss of production where "*income*" is substituted for "*production*". This fundamental tool, that for the first time includes price risk management, is proposed as a *copy-paste* of mutual funds for production risks[42]. At best the IST may be considered as a "suggestion" and not a fully designed instrument to deal with farm income risk management. Even a sound "*suggestion*" should be supported by few basic foundation piers. Article 39 states that "*MS shall define the rules for the constitution and management of the mutual funds, in particular for the granting of compensation payments to farmers in the event of crisis*"[43]. Any group of farmers, or other stakeholders, interested in mutual funds, any MS interested in supporting an IST with a national budget, would like to know if tax documentation should be used for income statement, how to solve issues of marketing contracts valuation, inventory adjustments, insurance payments and many issues that the US AGR policy has confronted. Is it possible to use farm income proxy through aggregation of production margins as done in the CAIS program in Ontario, Canada? Is it possible to use income proxy through indices of market price and yield with deduction of standard costs per type of farming?

More generally, the **co-financing of risk management instruments** induces a double stage of development. Any initiative "*from the field*", agricultural insurers, organized groups of farmers such as unions or cooperatives, must first work with the MS administration, the Ministry of Agriculture usually, to defend proposals and be granted the EU's required agreement. This national stage, the first filter, creates difficulty in managing the "*in between*" position: pressure of the project with limited technical grounds or borderline characteristics and pressure of the principles of the Commission with few applicative guidelines. The consequence is a low level of innovation produced by self-censorship and high transaction costs which impede the development of basic projects.

4.3. Dynamic versus static methods for implementing policy instruments

Risk management instruments supported by the US agricultural policy are dynamic by definition as they are linked to production and market conditions. They require individual historical information on farm structure, acreage and yields. Area-based indices are developed and maintained for group insurance but also "shallow loss" insurance such as SCO. This information is used for eliciting "*expected*" and real crop yields. Reference markets are used for defining "*expected prices*" at planting period as well as "harvest" prices. The guarantees of the various individual and group insurances are thus defined and understood by farmers.

The US insurance development based on public-private innovation and improved long-term databases on risks **has led to an experience curve on policy design, loss expertise and limitations of fraud**. The transformation of the first generation of revenue insurances (such as CRC, IP and RA), into a **Common Policy RP** in 2011, as well as the transformation of area-based insurances (GRP and GRIP) into the **ARPI policy** are examples of learning and adapting from past experience.

The **ARC safety program** also requires information for computing benchmarks on crop revenue, yields and prices, at individual and area-based levels and compares them with

[42] The measure fiche provided to MS by the Commission, which is supposed to provide guidelines for implementation, contains not an additional word to the text of Article 39.
[43] See Footnote 39.

revenues of the year. The **PLC** for main crops and **DMPP** for dairy products use price indices that require a follow-up of futures and OTC markets.

Dynamic off-farm risk management strategy can be integrated with on-farm measures within a context of well-defined safety nets. Farmers can choose their risk management programs and their levels of coverage and related premiums. It is not an easy task but **USDA has launched programs in 2014 to develop web-based training and decision tools.**

The main **EU policy instruments** do not require such dynamic information on production flows and market prices. Direct payments are mainly based on fixed units of production and safety nets are *ex-post* measures that require *ad hoc* information provided by MS. The information required for handling potential crises is not really known. The method of information processing by committees of experts to manage crisis are also quite opaque.

As stated in the previous section, the three risk management "*instruments*" that may be financially supported by the CAP 2014-2020 do require expensive field information databases and dynamic processing. This is obvious for **insurance policies** compensating for production risks, it would be the same case for index-based policies and revenue policies if developed. **Mutual funds** also require good data bases for creating a sound plan for premiums and effective compensation. The document for official agreement of the mutual fund FMSE created in France in 2013 for compensating loss due to sanitary events (and also environmental incidents) illustrates the amount of information required to build a plausible expected balance between fees and compensations for each covered risk. It should be mentioned that most groups of farmers participating in the FMSE had developed an instrument previously, which was like a mutual fund, and therefore already have the required database and methods for compensating production risks. The FMSE also illustrates the need for a complex organization with different levels of mutualisation a first level with specific risks per production (managed into specialized sections) and a second level among productions (managed by the common section). Any **IST** that would be developed in a MS will also require a huge investment in methods and data collection.

To support the opposition between the **dynamic US** versus a **static EU approach**, **a comparison can be stated in terms of research and extension on risk management tools and safety nets.**

Research managed by the RMA is extensive in the US: programs on revenue insurance for additional agricultural products requiring specific data and information have been developed for many years. A variety of new programs are required in the 2014 Farm Bill, from improvements on margin, whole farm and index-based insurance to additional agricultural products (organics, biomass).

Universities, research institutes, and private insurance companies are used, usually as networks monitored by the USDA (RMA, FSA and ERS), for developing innovation in risk management decision tools. In the meantime, universities and extension services are asked to contribute for farmer education and training to develop optimal risk management strategies using the latest private and public instruments with a $6 million budget. Under this program, the National Coalition for Producer Education (NCPE)[44] lead by the University

[44] **Partners to develop web-based decision tools: University of Illinois as NCPE lead**: Michigan State U., Montana State U., Watts & Associates, Delaware State U., U. of Arkansas, North Carolina A&T U., U. of Wisconsin, Cornell U., Pennsylvania State U., Ohio State U. and U. of Minnesota. **University of Missouri**

of Illinois and the National Association of Agricultural and Food Policy Center (NAAFP) will share a $3 million grant to develop new online decision tools related to the safety nets and risk management programs available under the 2014 Farm Bill[45].

Three different web-based tools are to be designed and implemented: (i) an ARC/PLC decision-making tool, including base acre reallocation associated with SCO/STAX programs, (ii) a MDPP and Livestock Gross Margin insurance program decision and (iii) a tool for optimizing buy-up coverage under the new Noninsured Crop Disaster Assistance program (NAP) provisions. The USDA also awarded $3 million to State extension services, a nationwide network of experts based at land-grant universities, for training farmers to develop risk management strategies based on new instruments available under the 2014 Farm Bill. **Farmdocdaily** from the University of Illinois has been providing (since September 2014) technical support[46] for farmer decision related to the 2014 Farm Bill with decision timing and simulation tools.

The EU has been investigating risk management tools for a decade with numerous high quality studies. European specialists have been questioned by the European Commission and the European Parliament. But due to limited practical (results) development, such work is episodic and has not induced permanent sound research from all available European resources. In terms of specialized research centers dedicated to agricultural risk management, two institutions are relevant, CEIGRAM (Technical University of Madrid) in Spain and IRMA (Wageningen University) in the Netherlands. Resources exist in all European countries but are not concentrated in dedicated organizations. **CEIGRAM** is very much linked to the Spanish risk management system as developed by ENESA, the State agency for agricultural insurance, but is also interested in broader EU issues of public policy and support for the private market. The research center is also the leader of a European and FAO consortium for managing the 2012-15 ULYSSES project[47] related to price risk management for an improved adequate worldwide food supply. **IRMA** also managed several research projects financed by the Commission with important results published (Meuwissen et al. (2008) for instance). The **Institute for the Protection and Security of the Citizen**, one of the seven scientific institutes of the **European Commission's Joint Research Center (JRC)** should also be mentioned–as they conducted, with a long list of experts, a comprehensive study on agricultural insurance schemes in Europe which covers regional risk assessment, management tools (both financial and insurance contracts) and policies. However, the last part of the study on the feasibility of an EU-wide system of agricultural insurance is tentative and may require further analysis. Because of such studies or independently of them, the EU proposal was later designed, 2009 then 2013, with different tools to be supported and without some requirements that are specified in the conclusive part of the JRC report.

Measures for **advisory services** are not explicitly related to risk management training and aid for decision making. Regulations (EU) No 1305/2013[48] state that a limited number of core priorities for knowledge transfer should be set. Risk management in agriculture is ranked seven among the twelve priorities. It is clear that the **co-financing** of Pillar 2

(FAPRI) and Texas A&M as NAAFP co-leads: Texas Tech U., Iowa State U., U. of Nebraska, Kansas State U., Mississippi State U., Oklahoma State U., Tennessee State U., U. of Georgia, and Fresno State U.

45 These web-based tools are now available online. See http://fsa.usapas.com/.

46 http://farmdocdaily.illinois.edu/2014/09/farm-bill-decision-deadlines-and-farm-bill-toolbox.html.

47 Co-financed by the EU DG Research and Innovation.

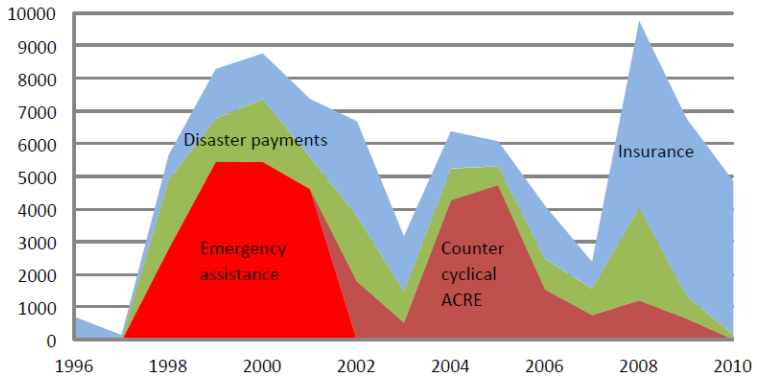
48 Within Regulation (EU) N° 1306/2013, just Article 12.3.b) is quoting "*risk management and the introduction of appropriate preventive actions to address natural disasters, catastrophic events and animal and plant diseases*" as a scope for Farm Advisory Systems. Article 15 of Regulation (EU) N° 1305/2013 dedicated to advisory services, farm management and farm relief services never mentions risk management services.

measures does not facilitate precise descriptions of actions and related budgets. This essentially means waiting for final discussions between the Commission and the MS on the Measure Fiche 17.1, 17.2 and 17.3 related to Articles 36-39 of Regulation (EU) No 1305/2013. In particular, the Measure Fiche (part 7, p. 10) explains Articles 14 and 15 of the regulation in stating "*support could be given to actions related to training/information on risks and risk management for farmers to help improve awareness of current risks, improve risk management strategies and provide know-how*". The use of "*could*" is indicative of the EU's unwillingness to impose basic measures to improve farmers' knowledge and understanding of risk assessment and management.

4.4. US budget flexibility versus EU budget stability

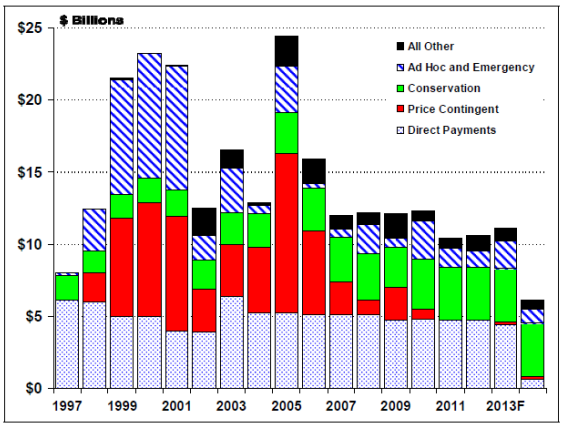
The instruments of the US policy for safety nets and support of risk management tools are now **directly linked to market conditions**. As a consequence, the budget to manage safety net programs is linked with expectations of market conditions and real annual spending will require financial adjustments. The 2014 CBO study is just an expectation of the US agricultural budget. While on average yield losses may be well-estimated, losses due to price decrease are much more difficult to anticipate. Figures 7 and 8 illustrate historical variable spending for past risk management and safety net instruments.

Figure 7: The various income stabilization schemes (US$ million)



Source: Butault et al., EP note 2012, p. 106.

Figure 8: US Government Farm Support, Direct Outlays, 1997 to 2014 (E)



Source: Schneptf (2014).

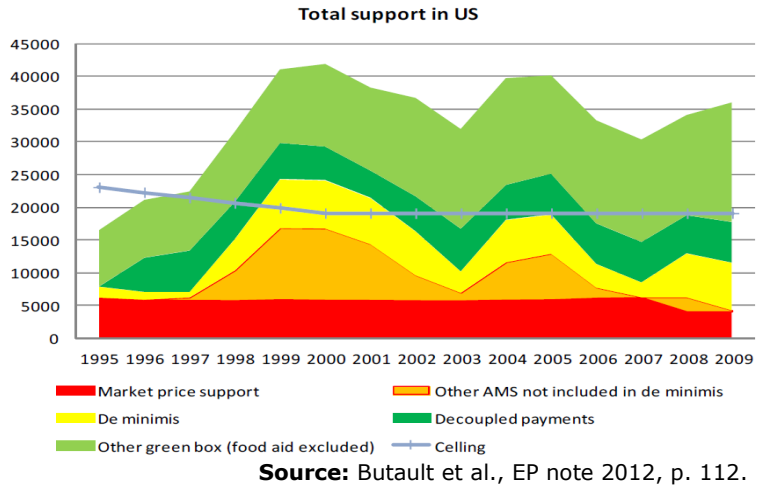
As 72% of the EU budget for agriculture and natural resources (Heading 2) is devoted to fixed direct payments, the uncertainty on spending for the 2014-2020 period is very limited. It is thus possible to consider the EU budget as (more or less) fixed. As safety net

management is flexible by nature, the CAP regulation created a special financial reserve in addition to an incompressible (inevitable) fixed and annual budget for dealing with the latest "*old*" safety net measures. The €420 million annual reserve for crises in the agricultural sector brings a limited flexibility as the amount of the financial reserve is very small with respect to the expected "*exceptional*" losses on agricultural markets. Some provisions on special instruments not included in the multi-annual financial framework exist that may bring additional flexibility for handling disasters in agriculture: the Emergency Aid reserve, the European Union Solidarity Fund, the Flexibility Instrument, the European Globalisation Adjustment Fund, and the Contingency Margin. However, the procedure is very bureaucratic and the available amounts are also limited. It should be noted that a Commission Working Paper (EC 2011) on CAP risk management toolkit options and potential impact suggested the creation of a "Global Agricultural Risk Management Fund" as a calamity fund (with definite rules of use). This suggestion has been transformed into the "*reserve for crises in the agricultural sector*" (Art.35 Reg. (EU) No 1306/2013), but could have been derived into a multiannual reserve focused on agricultural crises off-side the MFF[49].

4.5. Amber box and *de minimis* clause versus Green box

The public policy instruments are notified in the Green box of the WTO rules (decoupled direct payments, conservation payments), and may be counted as "product specific" in the Amber box (marketing loans, price support for dairy and sugar)[50] or counted as "non-product specific" in the Amber box (counter-cyclical payments, crop and revenue insurance payments). Large amounts of "non-product specific" support in the US are discounted using the *de minimis* clause as the value of the domestic agricultural production is large. It may be estimated that two thirds[51] of the support to be declared in the Amber box have been discounted in the 2014 US notification for year 2011 (WTO, G/AG/N/USA/93 2014). As a consequence, the recent **US support** to agriculture under WTO rules may be illustrated in Figure 9. It is clear that the *de minimis* clause is allowing the US to fulfill their WTO commitment, mainly in the 1999-2001 period and later in 2005 (Bureau 2012).

Figure 9: US Distorting support and maximum WTO ceiling, 1995-2009



Source: Butault et al., EP note 2012, p. 112.

[49] The financing of the Russian embargo crisis in 2014 would have been much easier to manage if this had been the case.

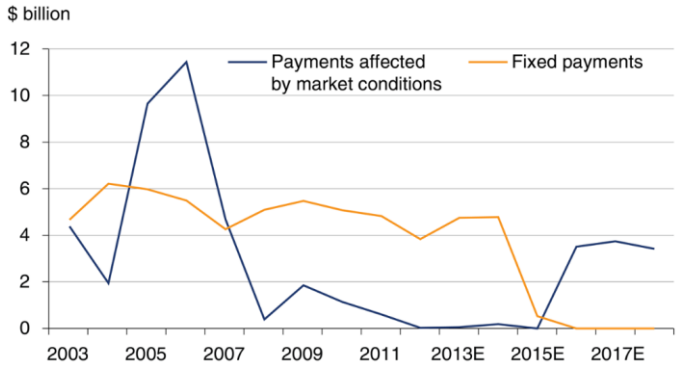
[50] But not counted in the AMS thanks to the *de minimis* provisions for many other commodities

[51] Respectively, $7.2, 6.6 and 9.9 billion exempted on Amber box values of $11.4, 9.8 and 14.5 billion in 2009, 2010 and 2011.

The 2014 Farm Bill substitutes augmented "**product specific**" programs (PLC and ARC) for former equivalent programs, adding new "non-product specific programs" (SCO and STAX) and repealing Green box programs (decoupled direct payments). Therefore, the possibility of the US to reach the AMS ceiling during the coming years is greater than in the previous Farm Bill, especially if commodity prices fall[52]. The US seems to be optimizing their support of risk management instruments and their commodity programs are designed to stay dynamically just under their AMS ceiling.

Figure 10 illustrates the mix of programs with fixed payments (production flexibility contract payments enacted under the 1996 Farm Bill and then direct payments of the 2002 and 2008 Farm Bills) and payments affected by market conditions in the 2014 Farm Bill.

Figure 10: Fixed versus variable payments under Farm Act commodity programs

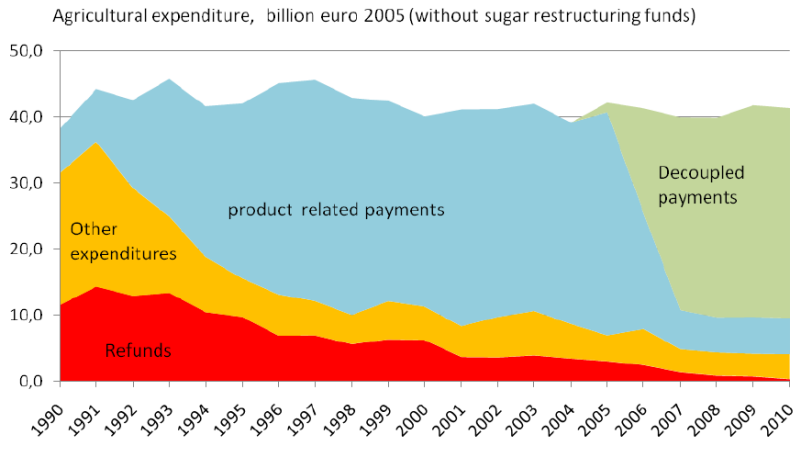


Note: In constant 2012 dollars, assuming 2 percent inflation for 2014-2018. E = estimated.

Source: USDA, Economic Research Service using USDA, Farm Service Agency CCC Table 35 and Congressional Budget Office, Cost Estimates for the Agricultural Act of 2014, Jan 2014.

In the meantime, the **EU agricultural policy** complies fully with WTO rules as required by all recent European agreements. The CAP 2014-2020 is the continuation of the policy implemented in 2003 where decoupled payments are the core of the farm sector programs. Figure 11 illustrates the recent changes in program spending.

Figure 11: Agricultural budget, composition, in constant euro, EU, 1990-2010

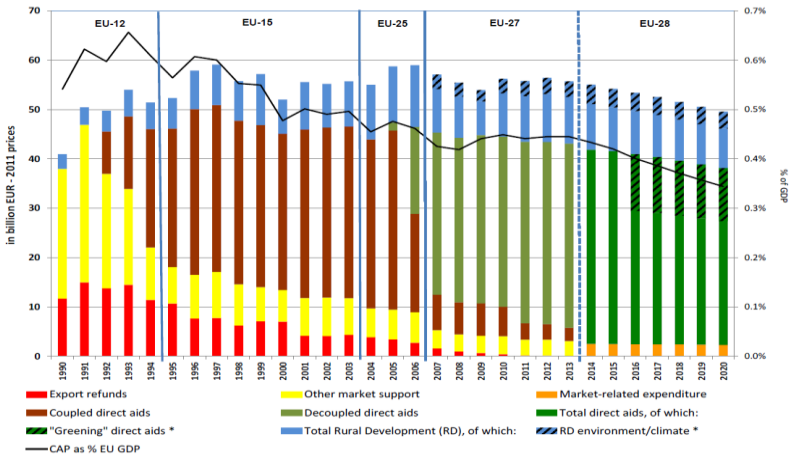


Source: Butault et al., EP study 2012, p. 87.

[52] As observed at the end of 2014, with some expectations of high compensations to farmers. But Schnepf (2014) indicates the gap between the US AMS ceiling and the current Amber Box ($15 billion) may cover large spending increases in commodity and risk management programs.

As a consequence, the CAP support to agriculture as described in Figure 12 has mainly been declared in the Green box since 2006 (and is planned to be for the future period 2014-2020).

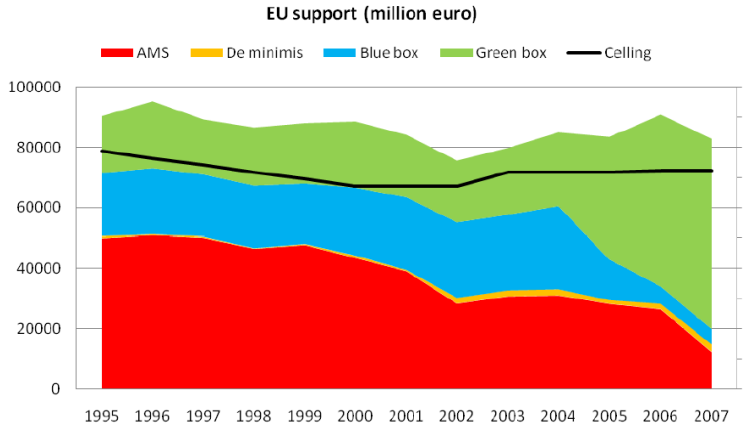
Figure 12: CAP support to agriculture, 1990-2020



Source: European Commission (DG AGRI).

Therefore, the current level of AMS is well below the authorized level as illustrated in Figure 13. The latest EU notification of domestic support to the WTO (WTO G/AG/N/EU/20, 2014) reports 7 billion € in the Amber Box (3 billion € in the Blue Box and 71 billion € in the Green Box), far below the AMS ceiling for the EU.

Figure 13: EU support under the various WTO categories, 1995-2008



Source: Butault et al., EP study 2012, p. 98.

Safety net and subsidized risk management measures have been triggered by market conditions with severe losses since the 2003 CAP reform and the late 2009 EU regulations. Articles 37-38 in Regulation (EU) No 1305/2013 state that, to qualify as a "*crisis*", an event shall destroy more than 30% of the average annual production of the farmer and be formally recognized by a competent national authority. Article 39 of the same regulation mentions that subsidized compensation should be granted when the drop of income exceeds 30% of the annual average income and capped at 70% of the loss.

4.6. A centralized organization in the US versus an EU double dichotomy (two CAP pillars and two[53] administrative levels)

The US agricultural policy has been designed by the Congress through successive Farm Bills. **The policy is implemented by specialized federal agencies from the US Department of Agriculture.** As one Farm Bill succeeds the previous one, the tools are designed for handling specific demands of agricultural sectors while remaining relatively homogeneous. **Two federal agencies** implement and manage linked safety net and risk management programs.

The **Farm Service Agency** (**FSA**) consolidated programs from several agencies in 1994. The Congress organized a system under which federal farm programs are administered locally. Local farmers elect a county committee, which reviews county office operations and makes decisions on how to apply federal programs locally. The FSA administers farm commodity (ARC, PLC, DMPP, DAP) and conservation programs. In addition, the agency makes and guarantees farm emergency loans through a network of State and county offices.

The RMA, created in 1996 out of the FSA, is a central organization for providing market-based risk management tools to farmers through research, management of the products distribution, and education about objective risk assessment and training. The agency has three divisions: insurance services, product management, and risk compliance. Insurance service is dedicated to product distribution, in particular managing contracts with private insurance companies, program administration and all types of support. Product management is responsible for policy development; from research to field tests and market development. Risk compliance controls the proper functioning of the policy through time, from both the farmer's and the private insurance companies' sides.

While FSA and RMA are independent agencies, their programs are based on **similar parameters**, such as price indices and county-based yield. The use of such parameters for the management of insurance policies and safety net programs is not strictly identical but principles are very similar (use of Olympic averaged price as well as averaged individual and county yields). The programs may also have redundant coverage requiring farmers to choose between safety net and insurance programs. For instance, farmers should not enroll a crop in a county for both a Supplemental Coverage Option (SCO) and Agricultural Risk Coverage (ARC).

FSA safety net programs and RMA insurance programs are adaptive to historical market conditions as guarantees are computed with a smoothing moving-average process (excepting the PLC program). Associated with emergency loans and potential intra-year marketing loans, the combined safety net and insurance programs tend to develop pluri-annual income stability that is supposed to induce farmers to make optimal investment decisions.

Safety net programs as well as insurance programs are also similarly oriented towards commodity revenues (and sometimes margin) and not towards whole-farm income. As previously stated, whole-farm insurance programs do exist in the US but had little commercial success[54]. It is surprising that, for a completeness of risk management instruments, the US did not offered to their farmers a subsidized or tax-exempted savings

[53] And sometimes "three levels" when the regional level is added.
[54] Additional research has been required in the 2014 Farm Bill.

account similar to the former Canadian Net Income Stabilization Account (NISA) for dealing with "*normal*" farm income risk. This "*omission*" might be explained by the fact that Congressional Agriculture Committees lack the authority to make tax policy[55].

As a result of **coordinated organization for research on risk assessment and policy design and for policy implementation, ten new insurance policies have been launched** just six months after the signature of the 2014 Farm Bill**.**

The European Union's safety nets and risk management instruments are supposed to be defined now, **implemented and managed separately under the two pillars of the agricultural common policy.**

The remaining instruments of the "*old*" CAP, intervention, storage and export refunds are now safety nets which are not often used but hopefully benefit from the Commission experience of market intervention. New safety nets instruments of the 2014-2020 CAP such as "*emergency measures*" or "*necessary measures*" are activated by the Commission under delegated acts[56]. The Agricultural Council should validate the measures and the budget origins of spending. As noted previously, even though the procedure looks clear but complex, the first emergency case, the Russian embargo, has already demonstrated **practical difficulties,** as presented in Box 3. The rules for using the reserve are not clearly defined only a few months after its official creation. The amount of the aid is capped for each MS but it is not clear if the Commission will harmonize the emergency measures among countries or if each MS will have the flexibility to choose "*adapted*" measures to local conditions[57]. Finally, the EU's capacity to use the "*new*" safety nets collectively, designed on principle but left **without practical methods of application**, such as triggers and coverage levels, may be questioned.

The situation of risk management programs is not better as it requires a cumbersome administrative procedure. These instruments that should be **co-financed by the EU and the MS**[58], require the approval of two (potentially three) administrative levels with double-checking of compliance to principles of constraints.

As a result of the broadly designed complex management of instruments**, safety nets and risk management tools, the consequences of the Russian embargo are not really handled by *ex-post* "*emergency measures*" of Pillar 1 and *ex-ante* instruments in Pillar 2 are caught up in a long administrative procedure between MS and the Commission. Expectations for a dynamic development of risk management tools within the EU are not positive:** little developments in the insurance market with the use of indices, limited development of mutual funds in countries able to induce new dimensions of solidarity among farmers, and no development of IST**.**

[55] This problem also exists in the EU augmented by the diversity of MS fiscal measures. It will be handled in Part 5 of the note related to the recommendations.

[56] About nine delegated and implementing acts were published in 2014 for developing the new CMO and eight additional acts for dealing specifically with the Russian embargo crisis (see Annex).

[57] Discussion among MS has arisen for choosing between direct aid scheme for compensating losses in designated farms and market measures to avoid a generalized income loss of producers.

[58] But harvest insurance are also proposed in Regulation (EU) No 1308/2013 for the fruits & vegetables and wine sectors with no particular link with article 37 of Regulation (EU) No 1305/2013. And initial costs of mutual funds in the wine sector are also mentioned in the same regulation without any link with articles 38 and 39 of Regulation (EU) No1305/2013.

BOX 3: EU CRISIS MANAGEMENT OF THE 2014 RUSSIAN EMBARGO
Administrative and Funding constraints related to the crisis reserve

Russia decided on August 7th to enact a year-long embargo–on food products from the EU, Norway, Australia, Canada and the United States. This ban has resulted in a threat of market disturbances caused by significant price falls due to the sudden loss of an important export market. Food products concerned by the embargo are meat, fish, dairy products, fruits and vegetables. The Russian embargo was a good test for the new CAP instruments for handling major market disturbances. Eight dedicated delegated and implementing acts were published in late August and in September. But it looks like the practical use of the new instrument should be improved for future cases of market disturbance.

First, the financial stop-and-go between the successive waves of allocated aid, the MS demands and the final spending is surprising for such an important issue. For fruits and vegetables as well as for dairy products, it was a weekly serial in newspapers to follow the process. As a consequence, everyone was wondering how much would be spent to support markets and how much would be left in the agricultural reserve for crises in the 2015 budget. At times it appeared the €433 million available were almost all spent with still incoming additional demands, then the after-check of MS demands was at a very low financial level, saving the financial capacity of the reserve. Finally, in late October 2014, it looked like the financial reserve had used most of its support capacity. AgraFacts (2014) indicated that €344 million have been used for market measures (fruits & vegetables) and storage support (dairy products) leaving €88 million in the reserve fund. The news agency indicated also the €88 million were already targeted to support the dairy market in the Baltic States and Finland. Whether or not these assertions turn out to be true[59], the Russian embargo just "proves" that the level of the financial reserve for the agricultural sector is inadequate. Farm lobbies are already clamoring for additional funding for such an exceptional event. In addition, difficulties in gathering pertinent information on production and trade flows on cheese, fruits and vegetables[60] are demonstrative of the need for improvement in dealing with the variety of events that may heavily disturb markets.

Second, the debate around the decision of the former Commission mid-October to use the agricultural reserve for dealing with market disturbances created by the Russian embargo and not a "windfall revenue" from milk levies is opening the question of additional participation of funds designed out-of-MFF for exceptional events. The outcome will be important for the future management of the new CAP design of safety net programs.

[59] Late November, Commission's official stated the €88 million still in the reserve turned back to €188 million but additional demands of support were requested for dairy products, fruits and pigmeat markets.

[60] Regulation (EU) No 992/2014 on storage of cheese repealing Regulation (EU) No 950/2014 published eighteen days before and Regulation (EU) No 1031/2014 supplementing Regulation (EU) No 932/2014 on market withdrawals and other means of support to fruits and vegetables published a month before illustrate such difficulties (see Annex).

5. TEN RECOMMENDATIONS FOR IMPROVING CAP SUPPORT TO FARM RISK MANAGEMENT INSTRUMENTS

KEY FINDINGS

- Supporting *ex-ante* measures for managing specific agricultural risks in addition to safety net programs dedicated to help farmers during market crisis or natural disasters is fundamental because it develops responsibility and involvement of stakeholders, from farmers to the full array of the risk market participants.
- Designing an optimal CAP support scheme for risk management instruments is not an easy task as MS are diverse in terms of production risk assessment, on-farm risk management capacities, and culture of risk management explaining why the results of ten years of tentative design for risk management instruments are so limited.
- The current project of supporting crop insurance development as well as mutual funds for compensating production and farm income losses due to natural disasters and/or major market disturbance with price spikes is on-line with adequate support of *ex-ante* measures. However, adjustments and complements are necessary if the report on the implementation of Article 36 (Regulation (EU) N° 1305/2013) due December 31, 2018 is to have a chance of containing information on effective risk management development.
- The main complements for an improved CAP are first related to a coordination between safety nets and private risk management tools, in particular in using common parameters for triggers and levels of coverage, in developing innovative (multiannual) farm income guarantees and precautionary savings. Field tests benefiting from public-private creativity should be supported to begin creating and taking advantage of an experience curve
- Budget flexibility is necessary to handle random events. It should be driven by extending the agricultural reserve fund by increasing the participative rate on direct payments (according to financial discipline rules) but also from individual savings of direct payments received.
- A restructured Pillar 1 is essential for monitoring the coordination of safety nets and risk management tools supported by the CAP. A dedicated Agency should be in charge of research coordination, field tests and validation of risk management instruments principles and structural components

The transition starting in 1992 from an historical CAP market stabilization model to a market-orientated model is constrained by the diversity of MS types of production as well as production conditions, such as climate and farm structure[61]. The two-stages (potentially three) of "*common*" political decision, the European bodies and MS, have led to general principles for targeting general objectives of the European Union, from adequate food supply in quantity and quality to fair standards of living, but also environmental public

goods. The three current instruments of Regulation (EU) No 1305/2013 related to risk management instruments are based on **sound principles**: responsibility of agents (individual and groups of farmers, insurers) and MS authorities, low distortive effects and capacity of cross compliance measures in favor of environment and resilience to climate change (Gohin 2012). However, the multilevel "*common*" technical decisions to implement instruments behind the principles, the Directorates of the Commission and the MS Ministries of Agriculture (or equivalents) have led to an administrative maze that impedes the development of instruments adapted to local needs and constraints. It has become clear that a **better public-private partnership** must be established to translate EU suggestions into practical instruments for the long-term benefits of the food market and the production-conservation of public goods in rural territories.

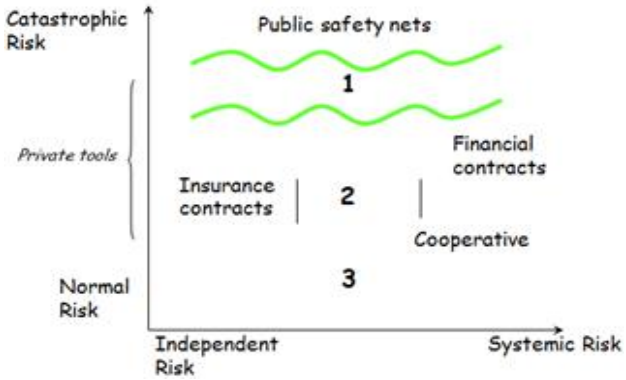
Ten recommendations for improving the CAP support to off-farm risk management instruments.are provided after the comparative analysis of the 2014 Farm Bill and the CAP 2014-2020[62]. They are presented in this last part under **four categories**:

- the need for a coordinated scheme of safety nets and support to specific private risk management instruments
- an openness to move from principles based on constraints to "*no-holds-barred*" field tests as real options for the future CAP
- the development of adapted resources: research and development networks and financial flexibility
- an EU organization for risk management oversight

5.1. The need for a coordinated scheme of safety nets and support to specific private risk management instruments

Figure 14 illustrates the need for a coordinated scheme of safety nets and support to specific risk management instruments. Three zones are of particular interest, (1) the transition between **safety nets and private instruments**, (2) the transition between the **traditional insurance market** on pure independent risks and the **finance market** (futures and OTC markets) on price systemic risk and (3) the transition between **on-farm and off-farm instruments**.

Figure 14: Mapping of recommendations 1, 2 and 3



Source: Author.

[61] As the new CAP created the small farmers scheme, risk management tools could be focused to the professional farmers at a first stage in order to facilitate their implementation.

[62] The need and the means to support futures markets development as well as derivatives on the OTC market are not developed in this note.

Analysis 1: Safety nets are instruments to deal with extreme adverse market conditions, loss of production and/or output price drops. Such price drops may be supply-driven by short-term excess supply with respect to an inelastic demand, or demand-driven by drops in consumer demand. Market measures like storage aid, product distribution and/or promotion as well as direct financial compensation to farmers may be adapted to circumstances of market disturbance. Safety nets are integrated in risk management strategies by farmers. They provide a "*free*" guarantee against extreme events, or in other words the risk premium for such extreme events is financed by the public sector. Safety nets are therefore useful but should be provided with care and efficiency. First, the "*crowding out*" of private risk management by safety nets should be avoided. Second, the benefit of the "*free*" risk premium against extreme events should be used to reduce the premiums of private risk management instruments.

***Recommendation 1*: Safety net measures related to individual financial compensation should be implemented based on transparent parameters to evaluate individual farm income loss due to market, climatic, sanitary or adverse environmental events. The use of index-based proxy for evaluating farm income losses should be promoted for reducing compensation delays as well as costs of management. Individual parameters as well as income proxy for (heavy) loss valuation should be harmonized with the same ones used for both crop insurers and mutual funds, which will help to price premiums and fees. Recommendation 1 is represented by Zone 1 in Figure 14.**

Analysis 2: Financial markets related to agricultural commodity products are slowly developing within the EU. Grain markets already have efficient futures markets providing reference signals on futures prices as well futures volatility (implied volatilities imbedded in option premiums). Such organized markets have induced active OTC markets with structured contracts for intra-annual price risk management. Such contracts should spread to dairy products and sugar with the end of production quotas. Insurance markets provide guarantees against major (but not all) production risks. But the financial and insurance markets are not linked by hybrid contracts dealing with revenue, product margin or whole farm guarantees. Opportunities of "*natura*l" diversification of such multiplicative and additive parameters have not been adequately explored and tested. OTC participants such as trading companies, cooperatives, banks and crop insurers are potential providers of hybrid contracts as well as *ad hoc* mutual funds to be created.

***Recommendation 2*: The EU should support instruments to fill the "*hole*" between the pure financial and insurance markets. Hybrid contracts of OTC contracts with a quantity and quality risk guarantee as well as insurance policies on revenue, product margin and whole farm income should be supported. IST provided by mutual funds or insurance could also fill this gap in partnership with organizations (cooperatives, insurers and banks) to take advantage of their specific know-how. Recommendation 2 is represented by Zone 2 in Figure 14**.

Analysis 3: Off-farm risk management tools provided by the private market are complementary to on-farm instruments. An adequate equity level with respect to the objective risk of the farm is the first means for on-farm risk management. The cash flows that could increase the equity level and reduce farm income risk may come from annual financial results and/or direct EU decoupled subsidies. An income stabilization scheme to reduce farm income risk requires that "*high*" yearly income compensates "low" income. But such a scheme, to be effective, also requires that "high" income should not be subject to

income-tax or that an adequate system of smoothing income tax over time be implemented. As direct payments are concerned, their modulation as an adaptive counter-cyclical instrument (similar to the ARC program in the US) could induce an income stabilization effect. However, it is not feasible with a fixed EU budget and requires taking full advantages of EU margins on WTO constraints. It would therefore be interesting to create the modulation at the farm level with rules to cope with shallow losses.

***Recommendation 3*: The EU should support the creation of savings accounts with validated pre-income tax provisions and withdrawal rules that could fill the "*hole*" of shallow losses ("*normal*" risk). The CAP could recognize some taxes exemptions as "national co-financing". The use of Direct Payments for adaptive provisions of the individual savings account should be considered. Withdrawals would then be linked to individual shallow income losses but also combined with safety net compensations for heavy losses. Recommendation 3 is represented by Zone 3 in Figure 14**.

5.2. An openness to move from principles based on constraints to "*no-holds-barred*" field tests as real options for the future CAP

Analysis 4: The CAP suggests three types of instruments for off-farm risk management that can be developed within MS under constraints related to the WTO basic agreement and fair competition within the common market. Some constraints are well defined such as the minimum rate of loss or the maximum rate of compensation. Some constraints are not. For example, "*index may be used in order to calculate the annual production of the farmer. The calculation method shall permit the determination of the actual loss of an individual farmer*". Constraints are also administrative in the process of formal recognition of adverse events by a "*competent authority*" of the MS, a formal accreditation of the organization in charge of managing the instrument (with rules "*to be defined*"). Complexity, uncertainty in handling constraints correctly, administrative set-up costs in addition to required technical costs, and even the constraints set in the current CAP, are barriers to creativity. As a consequence, the chances of developing risk management instruments in the near future are low.

***Recommendation 4*: The EU should first encourage the creativity of the private sector to take full advantage of the three basic suggestions of the CAP 2014-2020. The promotion of the CAP suggestions should be organized by the Commission within the MS, far from the administrative Measure Fiche provided currently. The EU should also support field tests to validate risk management concepts, articulation of existing methods and additional instruments.**

Analysis 5: Problems in developing practical instruments are numerous. They are first related to the model design through mass-data processing or simulation, the choice of quantitative parameters and proxy. Other problems arise in the implementation process (percentage of insured farmers, geographical extension). Field tests should develop knowledge and know-how on dedicated issues.

***Recommendation 5*: Establish targets for field tests to develop a learning process, for instance:**

- **the use of biophysical and weather indexes;**
- **the use of farm sample-based indexes for countries with small farms and low levels of individual information;**
- **premium estimation of well-defined layers of risk;**
- **revenue and margin coverage by insurance policies and/or mutual funds;**
- **determination of the reinsurance requirements;**
- **proxy models of farm income by type of farming;**
- **pluri-annual farm income risk management.**

Analysis 6: Self-censorship and *a priori* constraints limit creativity. Some of the current limitations on risk management instruments in the CAP 2014-2020 may be adjusted quite easily, others may require political agreements. Cost-benefit analysis will be required for authorizing constraint removal or adjustments. But first, the benefits of a private-public partnership should be harnessed.

***Recommendation 6*: Remove all current constraints on field tests (WTO Green box and, national (fiscal) aid that could be adjusted accordingly to ensure fair competition in the common market, budget inflexibility).**

5.3. The development of adapted resources: research and development networks and financial flexibility

Analysis 7: Risk management is complex as it deals with the second moment of farm income distribution, the standard deviation, and not the first one, the average farm income level. The private risk market is linked to the demand of income stabilization and/or guarantee against adverse events. The demand of methods and instruments is related to farmers risk aversion, willingness and capacity to pay for guarantees. Private instruments that contribute to risk management strategies are diverse, on-farm and off-farm, based on diversification or risk transfer, from financial or insurance-based contracts. Instruments may be redundant, as revenue insurance is quite similar to crop yield insurance associated with a synthetic call option on the OTC market[63]. Instruments may be complex on the OTC market, like structured forward contracts, barriers or rainbow options. Efficiency analysis of individual instruments as well as portfolio of instruments available to farmers are permanent issues. The risk management issue will surely be subject to further discussion between the Commission, the Council and the European Parliament. The continuing debate about role and effectiveness of direct payments will increase the pressure to support risk management instruments in coordination with safety nets. Therefore, investment in research, education and training is essential to facilitate the development of the private risk market, with and without public support.

***Recommendation 7*: Create long-term collaborative networks of European Universities with research and transfer expertise. Such networks should support first theoretical analysis of supply and demand for risk management tools (from risk aversion measures to strategies from the demand side, from risk premium valuation with adequate database requirements to design instruments with "*reinsurance*" requirements from the supply side). It should also support field**

[63] Buying an option to buy, a call, is equivalent to a long cash position plus an option to sell a put.

tests in their design and/or *ex-post* follow-up. Transfer of knowledge to extension and advisory services would also be an objective of such a network.

Analysis 8: Risk management requires a level of budget flexibility, mainly when supporting instruments dealing with systemic risks. The first level of variability is related to the size of the capital insured, which itself is related to the surface insured (roughly equivalent to the number of farmers insured), commodity prices, and choices in the rate of coverage. The second level is related to public re-insurance when required (potential of heavy losses, lack of private-re-insurance).

***Recommendation 8*: Create adequate flexible funding adapted to the development of risk management tools. Such flexible funding can be found in specific EU reserves (with rules of use). In particular, the agricultural-specific reserve could be expanded by increasing the participative rate from 1.3% to an adequate percentage in relation with some public re-insurance requirement. Such reserve should be cumulative from year-to-year. It may also be found in individual savings accounts created with (or without) direct payments.**

5.4. An EU organization for risk management oversight

Analysis 9: The historical dichotomy between Pillar 1 and Pillar 2 may be considered as obsolete (Mahé 2012). Market measures are provided in Pillar 2 while rural public goods are major cross-compliance issues for direct payments in Pillar 1. As a consequence, rules of EU support in Pillar 1 and co-financing in Pillar 2 are questionable for support to risk management tools that have feedback impacts on agricultural price (implicit) volatility. In other words, if the optimal farmer behavior with respect to exogenous and now endogenous price volatility is a "public" good, if therefore optimal investments in agriculture and production innovation (towards a more sustainable and more climate resilient agriculture) are a common European objective, then the dichotomy between Pillars 1 and 2 should be revised to have a common agricultural policy within the EU.

***Recommendation 9:* Create a "*restructured Pillar 1*" (or a new Pillar 3) which will, under a single Agency, coordinate and manage risk management issues (from safety nets to support of private instruments) at the EU and local levels. This unique EU authority will set the right level of budget flexibility and instruments to provide flexibility (nested reserve funds, savings of direct payments for instance). The EU authority will be in charge of research coordination, field tests and validation of adapted risk management instruments (with their structural components: income proxy, area-based yield, reference price).**

Analysis 10: Direct support to private risk management tools (through short and long-term subsidies as well as indirect support through public information improvement, market regulation against systemic risk on the OTC market or education and training) requires a long term strategic plan, supported by a political agreement. Such a plan would justify public financial support by creation of public goods. The move towards the effective implementation of risk management instruments should be organized as soon as possible.

***Recommendation 10*: Establish strategic goals for the "*restructured Pillar 1*" in charge of coordinating EU and local-level risk management instruments (safety nets and private instruments). As developing such a plan runs the risk of becoming a long-term project, short term objectives must be set, such as monitoring field tests, cross-pollination between MS, building an experience curve**

between MS to decrease set-up and operational costs, and valuating public goods that justify subsidies.

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ANNEX

LIST OF BASIC AND DELEGATED / IMPLEMENTING ACTS RELATED TO THE CAP REFORM

CAP BASIC ACT		DELEGATED / IMPLEMENTING ACT	STATE (Nov. 2014)
DP	Regulation (EU) No 1307/2013 of the European Parliament and of the Council establishing rules for direct payments to farmers (OJ L 347, 20.12.2013, p. 608).	Commission Delegated Regulation (EU) No 639/2014 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and amending Annex X to that Regulation	Adopted & published (OJ L 181, 20.6.2014, p. 1)
		Commission implementing regulation (EU) No 641/2014 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy	Adopted & published (OJ L 181, 20.6.2014, p. 74).
		Commission Delegated Regulation (EU) 1001/2014 amending Annex X of Regulation No 1307/2013 on direct payments	Adopted and published (OJ L 281, 25.9.2014, p.1)
		Commission implementing regulation (EU) No 1044/2014 establishing budgetary ceilings for 2014 applicable to certain direct support schemes	Adopted and published (OJ L 290, 4.10.2014, p. 1)
HZR	Regulation (EU) No 1306/2013 of the European Parliament and of the Council on the financing, management and monitoring of the common agricultural policy (OJ L 347, 20.12.2013, p. 549)	Commission Delegated Regulation (EU) No 502/2014 about the linear reduction of payments in 2014 and financial discipline for calendar year 2014	Adopted & published (OJ L 145, 16.5.2014, p. 20)
		Commission Delegated Regulation (EU) No 640/2014 supplementing Regulation (EU) No 1306/2013 with regard to the integrated administration, the control system and administrative penalties for non-compliances with obligations (IACS/Cross Compliance)	Adopted & published (OJ L 181, 20.6.2014, p. 48)
		Commission delegated Regulation (EU) No 809/2014 laying down rules for the application of Regulation (EU) No 1306/2013 with regard to the integrated administration and control system, rural development measures and cross compliance	Adopted and published (OJ L 227, 31.7.2014, p. 69)
		Commission delegated Regulation (EU) No 906/2014 supplementing Regulation (EU) No 1306/2013 with regard to public intervention expenditure	Adopted and published (OJ L 255, 28.8.2014, p. 1)
		Commission delegated Regulation (EU) No 907/2014 supplementing Regulation (EU) No 1306/2013 with regard to paying agencies and other bodies, financial management, clearance of accounts, securities and use of euro	Adopted and published (OJ L 255, 28.8.2014, p. 18)
		Commission implementing Regulation (EU) No 908/2014 laying down rules for the application of Regulation (EU) No 1306/2014	Adopted and published (OJ L 255, 28.8.2014, p. 59)
RD	Regulation (EU) No 1303/2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund (OJ L 347, 20.12.2013, p. 320)	Commission Delegated Regulation (EU) No 240/2014 on the European code of conduct on partnership in the framework of the European Structural and Investment Funds	Adopted & published (OJ L 74, 14.3.2014, p. 1)
		Commission Delegated Regulation (EU) No 480/2014 supplementing Regulation (EU) No 1303/2013	Adopted & published (OJ L 138, 13.5.2014, p. 5).
		Commission Implementing Regulation (EU) No 288/2014 laying down rules pursuant to	Adopted and published (OJ L

		Regulation (EU) No 1303/2013	87, 22.3.2014, p.1)
		Commission Implementing Regulation (EU) No 821/2014 laying down rules for the application of Regulation (EU) No 1303/2013 of the European Parliament and of the Council as regards detailed arrangements for the transfer and management of programme contributions, the reporting on financial instruments, technical characteristics of information and communication measures for operations and the system to record and store data	Adopted & published (OJ L 223, 29.7.2014, p. 7)
		Commission Implementing Regulation (EU) No 964/2014 laying down rules for the application of Regulation (EU) No 1303/2013 as regards standard terms and conditions for financial instruments	Adopted & published (OJ L 271, 12.9.2014, p. 16)
		Commission Implementing Regulation (EU) No 1011/2014 laying down detailed rules for implementing Regulation (EU) No 1303/2013 as regards the models for submission of certain information to the Commission and the detailed rules concerning the exchanges of information between beneficiaries and managing authorities, certifying authorities, audit authorities and intermediate bodies	Adopted & published (OJ L 286, 30.9.2014, p. 1)
	Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development (OJ L 347, 20.12.2013, p. 487).	Commission Delegated Regulation (EU) No 807/2014 supplementing Regulation (EU) No 1305/2013 on support for rural development by the EAFRD and introducing transitional provisions	Adopted and published (OJ L 227, 31.7.2014, p. 1)
		Commission implementing Regulation (EU) No 808/2014 laying down rules for the application of Regulation (EU) No 1305/2014	Adopted and published (OJ L 227, 31.7.2014, p. 18)
CMO	Regulation (EU) No 1308/2013 of the European Parliament and of the Council establishing a common organisation of the markets in agricultural products (OJ L 347, 20.12.2013, p. 671)	Commission Delegated Regulation (EU) No 499/2014 supplementing Regulation (EU) No 1308/2013 by amending Commission Implementing Regulation (EU) No 543/2011 relating to the fruit and vegetables and processed fruit and vegetables sectors	Adopted & published (OJ L 145, 16.5.2014, p. 5)
		Commission Delegated Regulation (EU) No 500/2014 supplementing Regulation (EU) No 1308/2013 as regards the granting of aid for accompanying measures in the framework of a School Fruit and Vegetables System	Adopted & published (OJ L 145, 16.5.2014, p. 12).
		Commission Delegated Regulation No 501/2014 supplementing Regulation (EU) No 1308/2013 as regards certain requirements related to the agricultural products benefiting from private storage aid	Adopted & published (OJ L 145, 16.5.2014, p. 14)
		Commission Delegated Regulation (EU) No 611/2014 supplementing Regulation (EU) No 1308/2013 as regards support programs in the olive oil and table olive sector	Adopted & published (OJ L 168, 7.6.2014, p. 55)
		Commission Delegated Regulation (EU) No 612/2014 supplementing Regulation (EU) No 1308/2013 as regards new measures under the national support programs in the wine sector	Adopted & published (OJ L 168, 7.6.2014, p. 62)
		Commission implementing Regulation (EU) No 614/2014 amending Regulation (EC) No 555/2008 as regards the application of certain support measures in the wine sector	Adopted & published (OJ L 168, 7.6.2014, p. 73)
		Commission implementing Regulation (EU) No 615/201.laying down detailed rules for the application of Regulation (EU) No 1306/2013 of the European Parliament and of the Council and Regulation (EU) No 1308/2013 of the European Parliament and of the Council in respect of work programs to support the olive	Adopted & published (OJ L 168, 7.6.2014, p. 95)

		oil and table olives sectors	
		Commission Delegated Regulation (EU) 665/2014. on the optional quality term " *mountain product*"	Adopted & published (OJ L 179, 19.6.2014, p. 23)
		Commission implementing Regulation (EU) No 913/2014 laying down temporary exceptional support measures for producers of peaches and nectarines	Adopted & published (OJ L 248, 22.8.2014, p. 23)
		Commission implementing Regulation (EU) No 932/2014 laying down temporary exceptional support measures for producers of certain fruit and vegetables and amending Delegated Regulation (EU) No 913/2014	Adopted & published (OJ L 259, 30.8.2014, p. 2)
		Commission implementing Regulation (EU) No 947/2014 opening private storage for butter and fixing in advance the amount of aid	Adopted and published (OJ L 265, 5.9.2014, p. 15)
		Commission implementing Regulation (EU) No 948/2014 opening private storage for skimmed milk powder and fixing in advance the amount of aid	Adopted and published (OJ L 265, 5.9.2014, p. 18)
		Commission Delegated regulation (EU) No 949/2014 laying down temporary exceptional measures for the milk and milk product sector in the form of extending the public intervention period for butter and skimmed milk powder in 2014	Adopted and published (OJ L 265, 5.9.2014, p. 21)
		Commission Delegated Regulation (EU) No 950/2014 opening a temporary exceptional private storage aid scheme for cheeses and fixing in advance the amount of aid	Adopted and published (OJ L 265, 5.9.2014, p. 22)
		Commission Delegated Regulation (EU) No 984/2014 fixing the import duties in the cereals sector applicable from 19 September 2014	Adopted and published (OJ L 277, 19.9.2014, p. 4)
		Commission Delegated Regulation (EU) No 992/2014 repealing Delegated Regulation (EU) No 950/2014	Adopted and published (OJ L 279, 23.9.2014, p. 17)
		Commission Delegated Regulation (EU) No 1031/2014 laying down further temporary exceptional support measures for producers of certain fruit and vegetables	Adopted and published (OJ L 284, 30.9.2014, p. 22)

Source: from European Commission (AGRI and REGIO).
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