Study on risk management in EU Agriculture

Annex 6 - Case study 6

Critical issues for the implementation of a mutual fund (IST) under Article 39 of the Reg. (EU) No. 1305/2013
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Case Study 6: Critical issues for the implementation of a mutual fund (IST) under Article 39 of the Reg. (EU) No. 1305/2013
Foreword

This case study report has been prepared within the “Study on risk management in EU Agriculture” which has been implemented by Ecorys and Wageningen Economic Research between December 2016 and October 2017.

The case study has been prepared by individual expert. The authors of each case studies were selected because of their specific subject expertise. It should be noted that the case studies reflect the opinion and personal style of these experts. The findings in these case studies are used to illustrate and triangulate the outcomes of the data collection in the main report.

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Executive summary

Main findings with respect to the specific question of the case study

Three Member States, Hungary, Italy, and Spain (the Castilla y Leon region) planned expenditures in their Rural Development programmes for creating an Income Stabilisation Tool (IST) under Article 39 for the period 2014-2020. At the beginning of 2017, none of these Member States had implemented such an IST fund, even though Hungary and Italy are still considering their implementation. Many studies have been performed on farm income insurance within Member States and a few on the feasibility of an IST under Article 39. It is known that other studies are currently performed in other Member States but no results have been yet published.

Several reasons may explain why Member States did not use such an instrument. They differ from one Member State to another with a wide range of expressed opinions. The case study focuses on technical reasons as expressed by stakeholders in the Member States wishing to develop an IST and as deduced from feasibility studies.

The main constraints are related to the three following questions of:
1. How to design an IST?
2. How to estimate the budget and finance an IST with a fixed budget when potential indemnities are random?
3. How to organise, initiate, and govern a mutual fund (identical to difficulties of an Article 38 mutual fund)?

Question 1: How to design an IST

Many features of the IST, as defined in Article 39 and interpreted in the fiche of Measure 17, are major constraints for its implementation:

- An IST based on accounting documents for determining “income loss” looks to be inadequate. Indexed income is preferred as the relevant method for calculating income loss;
- A sectorial IST has more chances to be developed as opposed to a multi-sectorial one, as parameters to be used are technical and well-known by specialised farmers. Indexed income is more appropriate for calculating sectorial rather than farm income;
- Proposed IST parameters such as thresholds of loss and rate of compensation are efficient only under strict conditions of gross margin volatility and margin rate (computed as the ratio of gross margin on sales and direct payments)\(^1\).

Question 2: How to estimate the budget and finance an IST with a fixed budget when potential indemnities are random?

- There are very limited estimates of budget requirements, either on average or for extreme values. Estimations based upon the European Farm Accountancy Data Network (FADN) are questionable as they are computed from historical data (back testing) and are without statistical distribution of outcomes per farm. A stochastic methodology is required for estimating an IST budget;
- How can a Member State with fixed programme expenditures support a mutual fund with stochastic compensation under the hypothesis of a constant or declining CAP budget?

\(^1\) The IST may be a true stabilisation tool or an instrument to transfer income upon choices of thresholds of loss and rate of compensation
As a consequence farmers consider the IST as an "unknown" system of market risk management and therefore are reluctant for its development.

**Question 3: How to organise, initiate, and govern a mutual fund (identical to the difficulties of mutual fund Article 38)?**

- The choice of sectorial or multi-sectorial\(^2\) IST raises very practical consequences in terms of organisation and governance. What is the right level of a sectorial IST: European level, national, regional when regions are specialised, or even at a local level (members of a cooperative, for instance)?
- What are the legal constraints for accreditation (quality of indicators, quality of the actuarial model, internal rules)?
- As a consequence, the IST may suffer from a precautionary behaviour of a national administration as described in case study no. 5 (Chapter 3 – FMSE in France) created by a lack of EU guidelines (production loss, reference of price, definition of income or gross margin, control of income loss with accounting documents, basis risk if indexed income).

**Main implications with respect to public policy**

As a consequence of the case study analysis, five recommendations in terms of public policy can be proposed:

1. Improve Article 39 of EU regulation No. 1305/2013 by:
   - Defining and allowing sectorial ISTs;
   - Allowing indexed income (basically gross margin) as a proxy for farmer income;
   - Asking for a computed threshold of loss from an actuarial model supported by a standard formula (see Point 3 p. 23 for details). The computed threshold value of loss should then be the minimal value for an IST accreditation. In doing so, the IST should provide income stabilisation and not income transfer.

2. Support development by providing general guidelines on fund design (identical to recommendations for an Article 38 mutual fund – see case study no. 5).

3. Guarantee fair competition on the common market by providing specific guidelines on the actuarial model. The guidelines should describe actuarial models that are replicable for all types of production (and sectors) and all Member States. A correct actuarial model should stabilise sectorial gross margin without income support effects.
   Each potential fund should provide historical market data, estimates of the lognormal parameters and, if necessary, the correlation matrix of input and output prices as used in the gross margin formula. A basic requirement for validating a mutual fund at the Member State and EU level could be an adequate frequency of compensation.

4. Reduce legal uncertainty. Legal uncertainty is a major constraint on allowing any leadership to support the project of an IST.
   Specifications are required for practically designing an IST. For instance, what is an acceptable level of basis risk when using indexed gross margin? Practically, the level of risk could be measured and accepted for IST validation by comparing Gross Margin Index and FADN Gross Margin.

\(^2\) Multi-sectorial to cover all main farm productions and therefore to approximate the total farm income
5. Support dissemination and innovation in creating a learning curve between key stakeholders (i.e., government, associations of farmers, actors in the food chain with long-term contracts and academics).

The cost to develop an IST, from feasibility design to practical implementation, is financially high, but also demanding in terms of leadership and management. It is crucial to share studies, design, and launching experiences for decreasing such costs.
1 Introduction

The toolkit of risk management instruments in EU Regulation no. 1305/2013 includes a “new” instrument, as compared with EU Regulation no. 73/2009. Article 39 defines a mutual fund for stabilising farm income, called an “Income Stabilisation Tool”, or IST. The main innovation of the IST is the introduction of price risk management into an instrument.

1.1 What is an IST under Article 39 of EU regulation no. 1305/2013?

The new RD Regulation for the CAP 2014-2020 addresses six economic, environmental, and social “priorities”. Within priority no. 3, “Promoting food chain organisation and risk management in agriculture”, Measure 17 focuses on the agricultural risk management issue. Embedded in Articles 36 to 39 of Regulation no. 1305/2013, Measure 17 is composed of three sub-measures: sub-measure 17.1 for financial contribution to insurance contracts (Article 37), sub-measure 17.2 for financial contribution to mutual funds compensating production losses due to climatic, sanitary and environmental risks (Article 38) and sub-measure 17.3 for financial contribution to mutual funds compensating income losses due to production and price risks (Article 39). The mutual fund of sub-measure 17.3 is usually called IST, which is short for Income Stabilisation Tool.

A Measure fiche on risk management was provided in 2013 to all Member States in order to explain Articles 36-39 and to be a guidance support to the development of the related instruments.

1.1.1 Characteristics of the IST

The IST, as proposed in Article 39 of EU Regulation 1305/2013, is a mutual fund that compensates for less than 70% of income losses when the actual loss is greater than a 30% decrease compared to a computed historical income (triennial or “Olympic” averages). Income is defined in the regulation as “the sum of revenues the farmer receives from the market, including any form of public support, deducting input costs”.

The fund creates a financial reserve via annual farmer contributions. In case of an adverse event creating eligible income losses, the fund compensates based upon its internal rules and under Article 39 requirements. The compensation then benefits from a public financial contribution limited to a maximum of 65% of its value, usually shared between the EAGF (75%) and the Member States (25%).

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4 Reg. 1305/2013 Annex II
5 Reg. 1305/2013. Art. 59. Para 3.b: “for all regions whose GDP per capita for the 2007-2013 period was less than 75 % of the average of the EU-25 for the reference period but whose GDP per capita is above 75 % of the GDP average of the EU-27”
1.1.2 Comments on Article 39 and the Measure fiche

The definition of income is not among the eighteen “Definitions” in Article 2 of Regulation 1305/2013. Article 39(1) refers to the income of the whole farm as a gross margin, including direct payments. The fiche of Measure 17 provides some explanations under Section 9.3 called “Calculation of income”, stating:

“For the calculation of income, the WTO agreement requires that “income derived from agriculture” (and not “revenues”) shall be taken into account. As the WTO does not specify further the elements of the definition of “income”, for the purposes of the newly introduced income stabilisation tool (IST), "income" is defined as “the sum of revenues the farmer receives from the market, including any form of public support, deducting input costs.” This is based on Eurostat’s Gross Farm Income which states that “The Gross Farm Income formula is output + subsidies - taxes - total intermediate consumption. "Subsidies" include direct and coupled payments, plus national subsidies; "total intermediate consumption" refers to variable input costs.

The positive or negative variations in the farmer’s stocks should also be taken into account when determining the average income, as the correct determination of stocks affects the level of gross production. In particular, the farmer must declare whether portions of the production in a given year were not put on sale (placed in storage, set aside for seasoning, etc.) or, on the other hand, stocks of production boosted the overall income level of the farmer. In this case as well the controls are based on information derived from databases on prices and yields. Neither should any changes in stocks of raw materials be overlooked.

Other sources of income indirectly related to agricultural activity such as energy production or rural tourism should be excluded from the calculation for the purpose of the IST”.

The fiche of Measure 17 (page 15), which should provide guidelines for implementing an IST, designates income as a gross margin on variable input costs based upon accounting documents for computing the gross production net of inventory variations.

In Section 11, “Verifiability and controllability” of the Measure fiche, it is simply written that “Reference should be made to the ‘Guidelines on verifiability and prevention of errors’”. In these guidelines, it is stated (page 15) that EU payments may be suspended if “the management and control systems for Rural Development Programmes are not functioning correctly”.

These abovementioned documents create legal uncertainty for the Member States’ administrations, and also for any farmers’ association willing to develop an Article 39 mutual fund, when they should be provided clear guidelines.

1.2 Impact of the IST

The instrument has been planned in the Rural Development Programme of only three Member States: Italy, Hungary, and a region of Spain (Castilla & Leon). The Kantor study (2015) has provided a synthesis of IST planned use - revealing very low interest from Member States - and a survey of several Member States, including Member States with no plans to develop such an instrument. The two reasons most often suggested by the survey, as presented in cluster 6: risk management p. 191-201 and case study on risk management p. 214, are the lack of guidelines which induces a legal risk in designing a new instrument, and an absence of any need for an IST, considering the current national portfolio of risk management instruments.
A year later, the European Parliament study (2015) provided a desk study on Rural Development Programmes as finalised between the Commission and the Member States, in particular the Table (p. 74) on planned expenditures of Measure 17.

Table 1: Planned expenditures on risk management measures under Rural Development Programmes (2014-2020) - FMSE activity, 2013-2016

<table>
<thead>
<tr>
<th>Country</th>
<th>Insurance premium</th>
<th>Mutual funds</th>
<th>Income stabilisation tool</th>
<th>TOTAL (€ million)</th>
<th>EU contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>5.1</td>
<td>0</td>
<td>0</td>
<td>5.1</td>
<td>63</td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Castilla y Leon</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>14</td>
<td>53</td>
</tr>
<tr>
<td>France</td>
<td>540.7</td>
<td>60</td>
<td>0</td>
<td>600.7</td>
<td>97.85</td>
</tr>
<tr>
<td>Croatia</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>57</td>
<td>85</td>
</tr>
<tr>
<td>Italy</td>
<td>1396.8</td>
<td>97</td>
<td>97</td>
<td>1590.8</td>
<td>45</td>
</tr>
<tr>
<td>Latvia</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>68</td>
</tr>
<tr>
<td>Lithuania</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>Hungary</td>
<td>76.3</td>
<td>0</td>
<td>19</td>
<td>95.3</td>
<td>82</td>
</tr>
<tr>
<td>Malta</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
<td>2.5</td>
<td>75</td>
</tr>
<tr>
<td>Netherlands</td>
<td>54</td>
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<td>0</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mainland</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>82</td>
</tr>
<tr>
<td>- Azores</td>
<td>2.4</td>
<td>0</td>
<td>0</td>
<td>2.4</td>
<td>85</td>
</tr>
<tr>
<td>- Madeira</td>
<td>0.8</td>
<td>0</td>
<td>0</td>
<td>0.8</td>
<td>82</td>
</tr>
<tr>
<td>Romania</td>
<td>0</td>
<td>200</td>
<td>0</td>
<td>200</td>
<td>85</td>
</tr>
<tr>
<td>Total</td>
<td>2212.6</td>
<td>357</td>
<td>130</td>
<td>2699.6</td>
<td>63</td>
</tr>
</tbody>
</table>

Source: European Parliament (2016)

Italy, Hungary, and Castilla y Leon in Spain planned €97, 19 and, 14 million respectively for the 2014-2020 period. Economic studies to support such expenditures levels are not available, as unpublished. However, these expected levels of expenditures look very modest with respect to the instrument’s aims and characteristics. To illustrate, the EAFRD expenditure estimate to support a sectorial IST for dairy producers in France (under a sectorial gross margin definition) is about €75 million per year (Cordier 2016).

1.3 Positioning of the instrument on the two axis map of agricultural risk

Article 39 IST mutual funds are private instruments dealing with independent and systemic production and price risks (output and inputs). As illustrated in Figure 1, they are therefore positioned at the upper level of the second layer of risks, at the right of the Article 38 mutual fund, as the IST is dealing with more systemic risks.

Figure 1: Positioning of the IST

Source: adapted from Cordier and Guinvarc’h (2002)
The positioning of the IST on the two-axis map suggests that links between the instrument and pure public safety nets is managed. Common parameters (such as income indices) should be required for synergy between an IST and public safety nets. The IST rules should also take into account long-term price agreements designed by food chains (see case study no. 4). Finally, revenue insurance contracts may be also in competition with an IST. Ministries, insurers, and farmers’ unions should collaborate to implement the best instrument.

1.4 Main question and related objectives of the case with expected contribution to the portfolio of cases

The main question of case study no. 6 is, "Why is the instrument of IST not implemented in any Member State, even though three of them have planned to do it?" The contribution to the portfolio of cases is meant to elicit necessary improvements for any IST development, but also to contribute ideas for better synergy between the IST and other risk management instruments, such as long-term contracts or precautionary savings.
2 Main outputs of the desk study

2.1 Facts and studies on IST or equivalent instruments

2.1.1 From the AGR to Whole-Farm Revenue Protection

The concept of insuring farm income is not new. The latest US Farm Bills developed a large insurance system for stabilising (and supporting) US farm income. As is well known, the traditional crop yield insurance has been "expanded" into revenue insurance for crop and plant production, as well as margin insurance for livestock production. Income insurance for the whole farm, named the Adjusted Gross Revenue (AGR) Insurance contract, has also been offered for years. This income insurance has not been successful up to now, even though several "improvements" have been tested over time. The 2014 Farm Bill explicitly asks to finalise an efficient whole farm income insurance contract.

The Adjusted Gross Revenue (AGR) Insurance contract was proposed by the Risk Management Agency\(^6\) (RMA) in 1999 as a pilot programme. The contract is explained in the AGR Handbook, published in 1998 by the FCIC\(^7\). The AGR contract provides protection against low revenue from natural causes and market fluctuations. The policy covers revenue from agricultural commodities, animals, animal products, and aquaculture species as a portfolio.

The basis of the contract is a whole farm’s revenue, and is therefore based upon the total sales of farm products within a year. The contract’s management requires information, available in accounting documents for “adjusting annual sales” to inventory variations as well as financial payable/receivable account variations. Fiscal documents are required.

In addition, the calculation of revenue loss requires a standard historical value which must incorporate variations in farm size. The standardisation of revenue involves an adjustment in production costs. Therefore, the “revenue insurance” also deals with production costs, and therefore may be considered as a partial “income insurance”.

The AGR is considered to be very complex to manage for the farmer as well as for the insurer, as data used are based upon Internal Revenue Service (IRS) income tax forms, used to report farm income and expenses.

Specifically, ten accounting documents to be provided for the last five consecutive years are required. Additional documents are also required, such as an annual farm report for the insurance year listing each commodity to be produced, the expected quantity of the commodity to be produced and the expected price for the commodity, beginning inventories and, if applicable, an indication of changes that may result in lower income for the insurance year than the historical average.

Complex adjustments for computing farm revenue loss are described for farm size variations, using accounting data on inventory levels, accounts receivables, and induced expenses. Numerous pages of the FCIC handbook are devoted to explanations that may create legal risks\(^8\). The robustness of such contracts may also be questioned, as farmers with experienced advisors may play with such complex rules.

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\(^6\) The Risk Management Agency is the US federal agency in charge of the development of the insurance scheme
\(^7\) FCIC 18050 (10-1998) – Adjusted Gross Revenue Standards Handbook (97 p.)
\(^8\) The AGR Handbook size has been growing from 97 pages in 1998 to 177 pages in 2016 (WFRP)
The AGR contract as well as the AGR-Lite for small farms has not been successful for the period 1999 to 2014, even though the successive handbooks supposed to "explain" the features and management of these contracts are more and more voluminous. The Farm Bill 2014 (Title XI, Sec. 11022) asked for a revision of the AGR contract, "improved" later by the RMA into Whole-Farm Revenue Protection (WFRP). Some improvements are important, such as the premium level linked to the farm diversification level, but the fundamental complexity of calculating such revenue based upon income tax documents remains. The complexity is illustrated in Annex 2.

2.1.2 Publications on Farm Income Insurance

Many academic studies have been published to evaluate the interest and impact of whole-farm income insurance. But few studies have been published on IST, as stakeholders willing to evaluate the instrument do not want to create any signal of interest or disinterest. Annex 1 provides a tentative list of pertinent publications issued from the Econlit database. Annex 1 also indicates a few reports and documents on the feasibility of income insurance and IST.

The main objective of these studies is to evaluate the stabilisation impact of income insurance or IST. Other objectives may be the viability of the tools or their potential impact on the inequality between farm incomes.

However, the general methodology is based on back testing of the instrument using the Farm Accountancy Data Network (FADN) and therefore presents important limitations. The first main limitation is related to adjusting to marketing practices and therefore annual management of storage. Year after year, market conditions are different, and high and low prices induce various marketing schedules in relation to farmers’ anticipations. Even though some adjustments to accounting documents are performed before being entered into the FADN database, these data are not adjusted for marketing decisions which impact the revenue and inventory value. The second limitation in using an FADN approach to simulate the impact of a whole-farm income insurance is the possible (and probable) adaptation of the farmer to the risk management tool. Very easy marketing and accounting adjustments by farmers may significantly change the potential and the viability of the instruments (income insurance or IST), creating an additional moral hazard. In other words, the real impact and real need for budget support would be very different than ones calculated from FADN ex-post data.

Instruments based upon accounting data may be subject to many critics, from the complexity of adjustments to the delays in the publication of accounting documents and therefore compensation payments. Gross margin indices are therefore required as a basis for managing income insurance as well as any Income Stabilisation Tool.

A study performed in the Netherlands (Van Asseldonk and Meuwissen 2016) analyses the impact of Gross Margin insurance on Dutch dairy and fattening pigs. The authors chose their own thresholds of loss and compare results from farm-specific gross margins, therefore "real" pig prices and feed costs to national gross margin are calculated from the national pig prices and feed costs series. They found consistent results indicating the capacity to use indices rather than farm data in developing gross margin insurance.
2.2 Studies on IST based on gross margin index

Two studies, among others, have been performed recently to elicit the impact of an IST on farm income index stabilisation, by Liesivaara and Myyrä (2016) and Cordier (2016).

2.2.1 IST for the pig sector in Finland

Liesivaara and Myyrä (2016) are considering the feasibility of an IST for pig producers. They immediately consider that computing farm income and loss of farm income on farm-level bookkeeping data, like in the AgriStability programme in Canada, is too costly and induces excessive delays for compensation. Therefore, they focus on the alternative: the calculation of a gross margin index which should minimise transaction costs, minimise delays of loss adjustment, and avoid moral hazard problems.

The main issue of the paper is the design of a gross margin index for pig production that could be used for an income stabilisation tool in Finland and test the random walk hypothesis of efficient markets for price series used within the index.

A Gross Margin Index\(^9\) is presented with a linear formula using four monthly price series for pig meat, feed, barley, and piglets. The monthly Gross Margin Index (GMI) presents quite a high variability; the standard deviation of the index is 27.4 with a 87.9 mean value. The variance decomposition of the GMI gives 65% of the total variance due to pig meat prices, 18% due to barley prices, and 15% due to piglet prices. Feed cost variability only provides 2.3% of the total variation. The authors also find a natural hedge between the pig meat price and feed cost that reduced the total variance of the gross margin by 18.6%.

The random walk analysis indicates that the pig meat price series, the major risk contributor, does not follow a Brownian motion and, therefore, has a long memory. The authors indicate in their conclusion that an insurance contract would not be optimal, but that a mutual fund would be more appropriate.

It is surprising that the authors did not directly analyse the random walk of the index they designed. It is not clear that lag between feed costs and pig meat prices have been well considered. Feed costs should be considered for the previous six month period before slaughtering date, and spot pig meat price. It is also surprising that the authors did not simulate an IST on the GMI series they calculated.

The study proposed by Liesivaara and Myyrä is technically very important for studying the behaviour of a gross margin index for pig production. Their analysis presents a sound methodology and interesting questioning on the use of futures prices as set by futures markets. However, they limited their analysis to the GMI without developing a real impact study of an IST on the pig sector in Finland.

2.2.2 IST for the dairy sector in France

The “interprofession” of the French dairy sector, CNIEL, developed a feasibility study in 2016 of an IST for stabilising the income of dairy producers and therefore securing the supply of the dairy industry. The objective of the study was to design the quality attributes of an IST and to simulate its impact on income stabilisation for dairy farmers. The study was supposed to last six months, from January to June. A Steering Committee has been created with representatives of the dairy producers from the farmers’ unions.

\(^9\) Formally computed as $GM = \text{83}\,P_{\text{pigmeat}} - \text{38}\,P_{\text{feed}} - \text{214}\,P_{\text{barley}} - P_{\text{piglet}}$ with $GM$ the Gross Margin, $P_{\text{pigmeat}}$ the price of pig meat, $P_{\text{feed}}$ the price of feed, $P_{\text{barley}}$ the price of barley and $P_{\text{piglet}}$ the price of piglets
FNPL (a specialised branch of FNSEA) and Confédération Paysanne, the dairy cooperatives (FNCL), and the private industry. The study has been performed by economists of the CNIEL supported by external expertise.

The preliminary questions for the IST design can be summarised as follows:
- Which income should be stabilised? Farm income or dairy production?
- Should income from accounting data, such as FADN, or a gross margin index be used?
- Should monthly or yearly data be used, as the volatility of monthly data is greater than yearly data?

The IST, as explained in the Measure Fiche 17, should be based upon accounting documents such as the Adjusted Gross Revenue (AGR) Insurance contract, proposed by the Risk Management Agency in the US since 1999.

Considering the inefficiency and burdensome work on accounting documents, the Steering Committee of the IST feasibility study decided in March 2016 that:
- The dairy activity should be considered and not the whole-farm income;
- The IST should be based on gross margin index;
- Comparison was required between monthly or yearly data in the IST functioning.

The choice of a “sectorial IST” has been considered as relevant by the Steering Committee, as it will be in the proposal of omnibus regulation by DG Agri in September 2016. Thus, the index approach was decided for practical reasons and with an understanding to introduce a difference between the real income of the dairy producer and the gross margin value, as it will be in the proposed amendments of the omnibus regulation by the COMAGRI of the European Parliament in May 2017. This difference is usually called “basis” and, as it is not a constant value, there is a risk of under or over compensation, called “basis risk”. The publication of the EU Dairy Standard Gross Margin within the EU Milk Market Observatory by the Commission was a great support for analysis (Annex 3), but its short history did not allow for practical use. In the future, its use could be broadened to supervise national IST functioning with the constraint of delays in publication.

The feasibility study analysed four gross dairy margin indices in France called:
1. Margin A /1 000 litres as the difference between the milk price (source FranceAgrimer) and the purchased feed costs index (source IDELE);
2. Margin B /1 000 litres as the difference between the milk price (source FranceAgrimer) and total feed costs index – purchased and produced on-farm (IPAMPA costs, source IDELE);
3. Margin C /1 000 litres as the difference between the revenue of milk, meat, and related plant production of the dairy activity of the specialised farm, and the total related feed cost index;¹⁰
4. Margin D /1 000 litres as the difference between the milk powder/butter value of milk and the total feed cost index.

As the definition of income in Article 39 includes direct payments (decoupled and coupled), the gross dairy margin was augmented by € 0.35 and € 70/1 000 litres for the IST simulation. The A dairy margin index was then called A1, A2 and A3 depending upon the level of direct payments considered, and identically for the other indices. Figure 2

¹⁰ This margin index is called MILC for “Marge IPAMPA Lait de vache sur Coût total indicé”
illustrates the four margins at level 2 (€35 of direct payments per 1 000 litres) during the period of 2006 to 2016.

Figure 2: Eleven years of Gross Dairy Margins in France (€/1 000 litres)

The IST, as proposed in Article 39, has then to be back-tested on twenty-four possible combinations of parameters: four dairy gross margin definitions, three levels of direct payments, and monthly/yearly data. A Monte Carlo simulation has also been performed under the hypothesis of the volatility of dairy gross margins. Table 2.1 gives an example of results for minimum efficient thresholds with respect to gross margin definition and €35/1 000 litres of direct payments. Margins A2 and C2 require a 10% threshold level of loss, margin B2 a 20% level, and margin D2 a 30% level.

Table 2.1 Minimum efficient thresholds for an IST in France in the dairy sector

<table>
<thead>
<tr>
<th>Margin type</th>
<th>Rate of margin (on total sales)</th>
<th>Coefficient of variation</th>
<th>Minimum threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>59%</td>
<td>0.16</td>
<td>10%</td>
</tr>
<tr>
<td>B2</td>
<td>32%</td>
<td>0.20</td>
<td>20%</td>
</tr>
<tr>
<td>C2</td>
<td>34%</td>
<td>0.14</td>
<td>10%</td>
</tr>
<tr>
<td>D2</td>
<td>26%</td>
<td>0.90</td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: unpublished CNIEL report

Table 2.2 gives an example of income stabilisation of milk producers by an IST under three threshold values. Compared to a base value of 0.21, the coefficient of variation is quite stable with a threshold of 30%, by 22% decrease with a threshold of 20% and by 34% decrease with a threshold of 10%. In the meantime, the average value of the gross margin increases from €101.2/1 000 litres to, respectively, €101.2, €103.8, and €105.6. The table illustrates the fundamental role of the threshold of loss for income stabilisation but also income transfer.

Table 2.2 Minimum efficient thresholds for an IST in France in the dairy sector

<table>
<thead>
<tr>
<th>Margin calculation</th>
<th>without IST</th>
<th>with IST threshold 30%</th>
<th>with IST threshold 20%</th>
<th>with IST threshold 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margin average B2</td>
<td>101.2</td>
<td>101.2</td>
<td>103.8</td>
<td>105.6</td>
</tr>
<tr>
<td>Margin standard deviation</td>
<td>20.9</td>
<td>20.9</td>
<td>16.8</td>
<td>14.4</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>0.21</td>
<td>0.21</td>
<td>0.16</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Source: unpublished CNIEL report
Table 4 gives the efficiency estimation of the IST, at a 20% threshold, on the Value-at-Risk (5%) of the milk producer, given the four types of gross margin and an equivalent market support at €35/1 000 litres. We observe a low impact for margins A2 and C2, respectively an 11% and 15% increase in VaR(5%), due to the high margin rate. Margin D2 has a high impact rate at 128%, since the margin rate is low. The frequency of compensation is also related to the level of the margin rate and the volatility of the gross margin. We observe a lower frequency for margins A2 and C2, and higher frequency for the margins B2 and D2. In the meantime, the public contribution is low for margins A2 and C2 and high for margin D2.

Table 2.3 IST efficiency as measured by VaR(5%) (€/1 000 l)

<table>
<thead>
<tr>
<th></th>
<th>Margin A2</th>
<th>Margin B2</th>
<th>Margin C2</th>
<th>Margin D2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without IST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>183 €</td>
<td>113 €</td>
<td>157 €</td>
<td>117 €</td>
</tr>
<tr>
<td>Standard dev</td>
<td>36</td>
<td>36</td>
<td>33</td>
<td>73</td>
</tr>
<tr>
<td>VaR (5%)</td>
<td>123 €</td>
<td>52 €</td>
<td>102 €</td>
<td>35 €</td>
</tr>
<tr>
<td>With IST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>185 €</td>
<td>117 €</td>
<td>160 €</td>
<td>170 €</td>
</tr>
<tr>
<td>Frequency of compensation</td>
<td>11%</td>
<td>23%</td>
<td>13%</td>
<td>31%</td>
</tr>
<tr>
<td>Average annual public subsidy</td>
<td>63 M€</td>
<td>100 M€</td>
<td>65 M€</td>
<td>237 M€</td>
</tr>
<tr>
<td>VaR (5%) avec IST</td>
<td>137 €</td>
<td>72 €</td>
<td>117 €</td>
<td>80 €</td>
</tr>
<tr>
<td>Accroiss. VaR(5%)</td>
<td>11%</td>
<td>38%</td>
<td>15%</td>
<td>128%</td>
</tr>
</tbody>
</table>

Source: unpublished CNIEL report

The feasibility study concludes with a recommendation for choosing adequate IST parameters for the French dairy sector, based upon the rate of the dairy margin on total revenue, the margin volatility, and the threshold of loss for compensation. The gross margin type B2 (with the hypothesis of equivalent direct payment of €35/1 000 litres) is recommended with a 20% threshold of margin loss. The expected frequency of compensation is 23%, leading to a substantial increase in VaR(5%) - an increase of 38% from €52 to €72. The contribution of farmers is calculated, as well as the average annual public subsidy (about €100 million) and extreme budget requirements.
3 Main outputs of the interviews with key stakeholders

3.1 Main results of the survey of the 25 Member States without any plan in their RDP to develop an IST

See Chapter 5 – section 5.3.1.

3.2 Main results of the three Member States with plans in their RDP to develop an IST

**Hungary**

Hungary has been focusing on the development of a private insurance system. The IST has not yet been implemented, but the Ministry is willing to do it. The lack of experience within the EU and the lack of guidelines from DG Agri is considered to be a weakness for the national development of one or several ISTs (in particular for the dairy and the pig sectors). Those responsible for the project are looking for experience in other Member States, feasibility studies, first implementation, or any useful information to support IST development in Hungary.

**Italy**

The IST is planned to be activated. The Ministry of Agriculture has allocated a budget for its implementation. But, so far, there is no national regulation for supporting the IST implementation and regulation of its functioning.

Several difficulties in implementing an IST in the “near future” have been expressed during interviews, such as:

- The difficulty in monitoring the historical income of farmers. Currently, there are loose rules for Italian farmers in terms of accounting. As a result, it is practically impossible to compute historical incomes for farmers based upon accounting documents and thus it is not possible to apply the current rules proposed in Article 39.
- The 30 % threshold is claimed to be too high. Farmers’ associations have asked for a reduced threshold.

An option that may be considered is the use of area/crop indexes to assess the input costs and revenues. The Ministry has suggested using benchmarks, but the possibility has not been agreed upon by farmers’ associations. In all cases, farmers’ associations have asked for a larger subsidy for IST.

**Castilla y Leon (Spain)**

It has been impossible to retrieve information on the IST project in Castilla y Leon. One farmers’ union gave contacts at the regional administration, but demands for information addressed to the Secretario General de Agricultura y Ganadería in Valladolid have not been successful.
Considering the information available, it is reasonable to state that no IST is yet functioning in the three Member States that planned to develop one. It also looks as if IST plans were oriented towards the dairy sector in the three concerned Member States. This "weak signal" may be connected with the feasibility studies and academic work performed in several Member States. These studies and publications are mainly developed on the dairy and pig sectors, as developed in Section 2 of the current case study.

**France**

The Ministry of Agriculture in France did not plan to implement an IST. It considered that there was no need in respect to the instruments in place. In addition, the Ministry raised the question of potential double compensation if farmers use two instruments - crop insurance and IST, for instance. However, the dairy sector, recently deregulated, has supported a feasibility study to estimate the potential efficiency of such an instrument. The feasibility study performed for the dairy sector has listed the main constraints of implementing the instrument and the need for legislative improvements. Most of them have been lifted in the proposed Omnibus regulation of September 2016 and within amendments voted on by the Committee on Agriculture of the European Parliament in May 2017. However, there has been no decision whether or not to create an IST in the dairy sector if the major constraints are lifted in the final document of the omnibus regulation.

The sugar beet sector, due to be deregulated in 2017, also performed a feasibility study under the assumption of being a sector compatible with a sectorial IST.
4 Conclusion and implications of the case study in terms of public policy

To conclude this case study on IST’s absence of development, it is clear that several reasons explain the absence of any IST’s development within Member States.

The main reasons, as elicited by the different interviews, are related to the three following questions:
1. How to design an IST?
2. How to estimate budget requirements and finance an IST?
3. How to organize, initiate and govern an IST?

Question 1: How to design an IST
- Indexed income looks to be the relevant method for calculating income loss. Conversely, calculating income loss using accounting documents is hardly feasible (US experience, absence of such farm documents, costs of management and control due to high moral hazard potential);
- A sectorial IST has more chances to be developed as opposed to a multi-sectorial one, as parameters to be used are technical and well-known by specialised farmers. Indexed income is better appropriate for calculating sectorial rather than farm income;
- The parametrisation of an IST (thresholds of loss, rate of compensation) should be a consequence of gross margin volatility and margin rate (computed as the ratio of gross margin on sales and direct payments)\(^{11}\).

Question 2: How to estimate the budget and finance an IST with a fixed budget when potential indemnities are random?
- There are very limited estimates of budget requirements, either on average or for extreme values. Estimations based upon the European Farm Accountancy Data Network (FADN) are questionable as they are computed from historical data (backtesting) and are without statistical distribution of outcomes. They are also subject to major changes due to high moral hazard potential. A stochastic methodology is required for estimating an IST budget;
- How can a Member State with fixed programme expenditures support a mutual fund with stochastic compensation under the hypothesis of a constant or declining CAP budget?
- Financing such a mutual fund is considered by farmers to be a potential transfer from a “stable” support system (from direct payments) to an “unknown” system of market risk management.

Question 3: How to organise, initiate, and govern a mutual fund (identical to the difficulties of mutual fund Article 38)?
- The choice of sectorial or multi-sectorial\(^{12}\) IST raises very practical consequences in terms of organisation and governance. For instance, a sectorial IST could be

\(^{11}\) The IST may be a true stabilisation tool or an instrument to transfer income upon choices of thresholds of loss and rate of compensation

\(^{12}\) Multi-sectorial to cover all main farm productions and therefore to approximate the total farm income
European, national, regional when regions are specialized, or even at a local level (members of a cooperative, for instance);

- Legal constraints for accreditation (quality of indicators, quality of the actuarial model, internal rules);
- The precautionary behaviour (that could be called the “umbrella behaviour”) of a national administration as described in case study no. 5 (Chapter 3 – FMSE in France) created by a lack of EU guidelines (production loss, reference of price, definition of income or gross margin, control of income loss with accounting documents, basis risk if indexed income).

Five recommendations in terms of public policy can be proposed:

1. **Improve Article 39** of EU regulation no. 1305/2013 by:
   - Defining and allowing sectorial ISTs. It could be a group of farmers who are facing the same type of risks in their technical farm organisation and willing to share the objectives of the fund;
   - Allowing indexed income (e.g. gross margin) as a proxy for farmers' income;
   - Asking for a calculated threshold of loss from an actuarial model supported by a standard formula. A fixed threshold level for compensation is questionable, as the sector conditions are different with respect to margin rate and margin volatility. Such a model is required to maximise the utility of income stabilisation and to avoid competition with income support instruments (e.g. decoupled payments) (Gohin 2017).

2. **Support development** by providing general guidelines on fund design (see recommendations for the Article 38 mutual fund).

3. **Guarantee fair competition on the common market** by providing specific guidelines on the actuarial model, including:
   - A standard formula based on lognormal distributions of price changes, a probability of indemnity occurrence (i.e. 20% for one year over five), a gross margin index based upon a linear and additive price structure, and a matrix of correlation;
   - A safety rule in the farmer annual contribution as estimated by the standard formula;
   - The induced threshold value (in percentage) of the loss to be compensated. The estimated threshold value of loss will then be considered as the minimal value for the model, and therefore mutual fund, accreditation;
   - Requirement on providing data, estimation of lognormal parameters (mean and volatility), and a correlation matrix that will allow a quality test of the model (algebraic or by simulation).

The guidelines should describe actuarial models that are replicable for all types of production (and sectors) and all Member States. It will allow fair competition between countries - a correct actuarial model will stabilise gross margins without income support.

4. **Reduce legal uncertainty and, therefore, “umbrella” behaviour**

Many parameters commonly miss clear specifications and interpretation at various levels of the national administration (i.e. what is an acceptable basis risk if using indexed income). Such legal uncertainty is a major constraint in allowing any leadership to support the project of an IST, or a mutual fund in general. The costs are too high to accept such a risk.
5. **Support dissemination and innovation** to harmonise the learning curve between key stakeholders (Government, association of farmers, actors of the food chain with long-term contracts and academics) and also serve as a base for innovation. For instance, experience could be shared on:

- The possibility or not of having several national funds, funds at the regional level and or at a private company/cooperative level like a captive insurance company;
- The mandatory versus voluntary participation in mutual funds;
- IST rules of management - for instance, a great improvement in mutual fund functioning would be to combine the precautionary savings and functioning rules of the IST (as currently proposed). The capacity for a farmer to get his deposits back in case of retirement, a personal event, or other unforeseen circumstances would be the best incentive to participate in a subsidised mutual fund;
- IST, coupled with long-term price agreements between farmers, the food industry, and even the retailing industry (see Case study no. 4).
Annex I References


https://www.gtap.agecon.purdue.edu/events/conferences/2017/default.asp


Liesivaara P. and Myyrä S. (2016), "Income stabilization tool and the pig gross margin index for the Finnish pig sector”, paper prepared for presentation at the 90th Annual Conference of the Agricultural Economics Society, University of Warwick, U.K., 4-6 April, 15 p.


Unpublished documents:


Interviews:

- Mrs Aniko Juhasz, Ministry of Agriculture, Member of the Agricultural Markets Task Force
- Mr Fabio Santeramo, Professor in economics, University of Foggia, Italy
- Mr Simon Severini, Professor in economics, Università degli Studi della Tuscia, Italy
- Mr Pablo Resco, farmers’ union, Spain
- Mr Benoit Rouyer, Chief economist, CNIEL, Paris
- Mr Pierre Rayé, Chief economist, CGB, Paris
## Annex II: Whole Farm Revenue Protection records required for 2017 enrollment

<table>
<thead>
<tr>
<th>Farmer records</th>
<th>Why?</th>
<th>More Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule F tax records from the previous 5 years (2011-2015)</td>
<td>To prove historical gross revenue and expenses.</td>
<td>Qualifying beginning farmers may be allowed to supply Schedule F’s from the previous 3 years.</td>
</tr>
<tr>
<td>Intended farm operation report</td>
<td>Lists commodities to be produced and the expected revenue from each for the insurance year.</td>
<td>A ‘Revised’ report is due during the insurance year if the production plan changes. A ‘Final’ report is due at the end of the insurance year.</td>
</tr>
<tr>
<td>Verifiable sales records</td>
<td>To verify Schedule F revenue and final production for the insurance year.</td>
<td>Allowable records include: 1) Third party verifiable documentation (i.e. accounting records, farm management records, warehouse receipts, ledger sheets, sales receipts, etc.). 2) Direct marketing sales records which can be contemporaneous records made at the time of commodity sale (i.e. at a farmer’s market), must include name of insured, market name, date, total cash receipts, and listed names of the commodities sold. For final reporting, estimated % of total cash receipts per each commodity sold, and revenue per commodity received is required.</td>
</tr>
<tr>
<td>Farm Inventory Report</td>
<td></td>
<td>For animals, animal products, nursery, and greenhouse products only because they are valued at the beginning and end of the insurance period.</td>
</tr>
<tr>
<td>Accounts receivable/payable</td>
<td>Used to adjust approved revenue to only revenue produced during the insurance period.</td>
<td>To show revenue from commodities produced during the insurance period that have been sold and are no longer on the farm but for which payment has not been received. Only required for the insurance year.</td>
</tr>
<tr>
<td>Pre-Acceptance Worksheet</td>
<td>To verify acreage and to determine insurability of perennial crops.</td>
<td>Discuss with your crop insurance agent for more detail.</td>
</tr>
</tbody>
</table>

Source: RMA-USDA
Annex III: The EU Dairy Standard Gross Margin

The Standard Gross Margins (SGM) defined in the Commission decision (EEC) no. 377/1985 is a first index approach of farm income. Gross production is the sum of the value of the principal product(s) and of the secondary products, and also includes public subsidies. Direct costs are specified for crops and livestock production. It allows classification of agricultural holdings by type of farming - in other words, sectorial production for different geographical areas. With decoupled payments in 2005, a new typology was required and the SGM has been replaced by Standard Output (SO) according to Commission Regulation (EC) no. 1242/2008. The EU FADN unit of DG Agriculture and Rural Development created a model of dairy margin for specialised farms. Based upon indices on milk prices, yield and feed costs as provided by Member States, the Commission published gross dairy margin time-series (per quarter) as illustrated in Figure III.

Figure III: Illustration of the third quarter EU Gross Margin for the dairy sector

Gross dairy margin index is therefore a relevant concept for estimating dairy farmer income. It is a simple estimate - almost instantaneous - as milk and feed prices are published every month in all Member States. As it is well known, the index approach is robust, avoiding all moral hazard problems in production as well as in accounting practices. And the quality of the income estimation by the index model may be periodically checked against FADN data.
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