DEMAND FOR MULTI-PERIL CROP INSURANCE: WHAT ROLE SHOULD PUBLIC POLICY PLAY?

H.A.B Van der Meulen, R.W Van der Meer*
Burgemeester Patijnlaan 19, 2585 BE, Den Haag,
Wageningen University and Research Centre,
Hollandseweg 1, 6706 KN Wageningen
The Netherlands
E-mail: harold.vandermeulen@wur.nl

M.A.P.M Van Asseldonk
Institute for Risk Management in Agriculture, Hollandseweg 1, 6706 KN, Wageningen University and Research Centre, The Netherlands

Abstract

By means of a survey among arable farmers the interest for multi-peril crop insurance was studied and the role public policy should play according to farmers was elicited. While the majority of the respondents were in favour of a public-private insurance scheme, a substantial part of the respondents regarded these types of risks as a business risk which should be borne by the farmers themselves or considered the risks as not threatening for the continuity of their farm. Government participation was found to be desirable, particularly in the form of enabling re-insurance. Farmers also feel that there should be more harmonisation between the various schemes in Europe and the extent of government support.

Keywords: risk, management, arable farms, policy, insurance

Introduction

Crop yields are usually considered rather volatile due to a whole series of stochastic factors. In severe cases a substantial decline can occur as a result of adverse weather conditions. To safeguard against these conditions, various forms of weather insurance policies in Europe and beyond exist, but they vary widely, both with regard to the cover provided and government participation. Subsidized multi-peril crop insurances are running in a number of countries, such as the U.S. and Canada. By contrast, such comprehensive crop insurance schemes are not standard in the EU. Despite the fact that in WTO context as well as EU context, restrictions are imposed for the level of government support for insurance, there are many variations within Europe. While in some member states the premiums are for example subsidized (also forms of ad hoc relief program exist), other member states do not have public-private crop insurance schemes at all. Comprehensive crop insurance policies exist in for example Spain, Italy and Austria. In some cases, there is considerable government support, up to around 50% of the premium.

In the Netherlands, commercial weather insurance schemes are marketed that cover against crop losses resulting from hail and windstorms. Mutual insurance schemes that indemnify losses as a result of precipitation are financed within a public-private framework whereby the government is the re-insurer. Other weather induced risks that are more systemic, in that they cause widespread but infrequent losses on many farms (e.g., frost and drought), are not amenable to insurance. In 2004 an average arable farm spent over 7,700 Euros on insurance (using figures from LEI's Farm Accountancy Data Network with

representative sampling of arable farms between 16 and 1,200 ege). Premiums for damage insurance, both for crops, buildings and machinery makes up 1/3 of this sum.

There is increasing political pressure in the Netherlands to find a structural long-term solution for these gaps in which no risk transfer is available. Besides that, a dominant stimulus for farmers to reform the current system is to harmonize Dutch state support to level the playing field between farmers within the EU. The objective of this study was to measure the willingness to pay for a hypothetical multi-peril crop insurance program and to elicit what role public policy should play according to farmers. Multi-peril crop insurance provides comprehensive protection against weather-related causes of loss.

First, a literature review was undertaken focusing on the impact of farm and farmer characteristics on the demand for insurance. Findings of empirical (descriptive) as well as prescriptive studies are addressed. Moreover, different roles of public policy with respect to crop insurance are addressed. Secondly, by means of a farm survey the willingness to pay for a hypothetical multi-peril crop insurance program and the role public policy should play was elicited.

Theoretical background

Factors influencing demand

By taking up a crop insurance contract a farmer will normally be accepting a small reduction in expected net returns, but is guarding against unfavourable outcomes. A risk-averse farmer would consider buying such a contract and the decision would depend on the level of the premium relative to the benefit perceived from the reduction in down-side risk (Arrow, 1996; Harrington and Niehaus, 1999).

Factors that may influence this decision include a farmer's degree of risk aversion, the costs involved in risk sharing, the relative size of a particular risk, the correlation of the risk with other risks, other sources of indemnity, a farmer's perception of the nature of the risks and the farmer's income and wealth (Barry et al., 1995; Hardaker et al., 2004; Harrington and Niehaus, 1999).

So a farmer is faced with the whole set of risks, and he should opt for an integrated risk-management strategy in which all business and financial risks are evaluated in a portfolio context (selecting a risk-efficient portfolio of on-farm and off-farm risky activities and risk-reducing instruments). Thus, for example, a decision about whether to insure against a particular risk, and if so to what extent, cannot properly be made without reference to other risky choices. Arable farms in Europe are typically multi-commodity operations. Hence, crop mix selections are important in the context of risk management, as a diversified production program is risk reducing in itself (Hardaker et al., 2004).

Many studies have been conducted to derive the variables influencing a farmer's actual insurance purchase decisions (e.g. Mishra and Goodwin, 2003; Sherrick et al., 2004; Mishra et al., 2005), or to predict a farmers' demand for insurance (Van Asseldonk et al., 2002). In these studies the variables were divided into farm characteristics and farmers' personal characteristics (e.g. Mishra and Goodwin, 2003; Sherrick et al., 2004). The farm characteristics analyzed referred to financial, structural and operational variables. Farmer-specific characteristics analyzed in insurance purchases were risk perception, risk attitude, age, education, tenure, previous exposure to risk and the experience level of the farmer. Studies of specific risks (e.g. Ganderton et al., 2000; Van Asseldonk et al., 2002) have focused on perils like hail, storm and flood, while those devoted to specific types of insurance on farms have mostly dealt with the purchase of crop insurance (e.g. Mishra and Goodwin, 2003; Sherrick et al., 2004; Mishra et al., 2005; Goodwin et al., 2004).

Reported empirical results with respect to the impact of farm size are inconclusive although size is often regarded a cause of purchasing more insurance. These larger farms have usually larger debts so cannot sustain adverse conditions that easily. Concerning risk perception and risk attitude reported empirical results show that arable farmers with higher risk perception level and farmers that are more risk averse are more likely to insure their crops.

Public role

A large proportion of the risks can be restricted by the entrepreneurs themselves by means of specific measures, or adequately covered with the aid of market parties such as banks, insurance companies, chain parties, and futures markets. Whether and to what extent an entrepreneur makes use of specific measures or the facilities offered by the market is a decision to be taken by the entrepreneur himself. The role of the government in this can remain limited to a facilitating role, such as providing training and information for entrepreneurs so that they can make the right decision for them on a more rational basis.

For a number of perils, often indicated as disasters, the various market parties (entrepreneurs and insurance/reinsurance companies) are unable to arrange sufficient cover for the risks for the primary producers. This can lead to problems of continuity for a proportion of the primary farms. The national government must make a decision about the role that the government wishes to play in the event of such weather-related disasters.

Important reasons why these risks are not covered within the market can be found in the nature, scale and unpredictability of the risk which are such that no party is willing or able to run the risk. In addition, new market products such as insurance, futures markets and derivatives are difficult to start up due to low participation rates and/or premiums that are perceived to be too expensive, the market potential expected by the insurance companies, and a lack of solidarity between primary farmers (i.e. problems on both the supply and demand sides);

Those directly involved (farmers and insurance companies) do want to move towards a more market-oriented approach to the abovementioned risks, for example in cases of weather-related disasters. The achievement of this is obstructed by the fact that the mutual solidarity within the agricultural sector seems to be declining rather than increasing (Baltussen et al., 2006), and the fact that the possibilities for insurance/reinsurance and the cover available for disasters are limited. Consequently, the primary farmers cannot initially transfer the risks to third parties. In the event of a disaster, people try to tempt the government into compensating the entrepreneurs.

Possible roles for the government in 'ensuring that' the market takes on a larger share of the risk cover include:

covering tail risks (a very small chance but very serious);

(initial) subsidies to promote participation and/or to get an insurance product onto the market (forming a capital buffer, subsidised insurance premiums, contribution towards administration costs). This is combined with the guarantee that uninsured parties will receive a negative response to requests made of the government in the event of losses;

improvement of information provision (in order to combat adverse selection and possibly moral hazard).

Research design and survey results

Research design

A survey was conducted in 2006 among arable farmers regarding their interest in crop insurance and the conditions to be met by such an insurance to be successful in the market. A random sampling of 1,750 specialized arable farmers larger than 10 hectares was selected. It was stressed that the individual information was valuable, even if the respondent was not interested in an insurance program at all. Ultimately 333 questionnaires were completed (response rate 19%). The time during which the survey took place coincided with a period of extreme weather conditions: particularly dry weather in July and very wet in August, followed by a very warm autumn. This resulted in low production of potatoes and onions, in particular. This is a clear illustration of the huge impact which various weather risks can have on production.

Analysis focused on the participation decision and the conditional decision about the amount of the willingness to pay. Preferences with respect to the role the government are addressed as well. The presented results are provided for two split samples, which were constituted on the basis of farm size.

Survey results

Larger farms (> 50 hectare) faced moderate till sizeable financial impacts of damage caused by weather related risks during the last ten years (table 1). Smaller farms considered the impact of risks on liquidity and debts smaller than the larger farms. Larger farms have on average a lower solvency (equity-to-asset ratio) and thus are more vulnerable in case of a severe damage. The most important impact of adverse weather conditions for both samples is that investments are postponed.

Table 1: Impact of risk on farm operation

	Average score [a)]	
	≤50 ha	>50 ha
Liquidity problems	1.79	2.24
Increased debt	1.65	2.08
Postponing investments	2.16	2.55
Reducing household expenditures	2.04	2.16

[a)] Impact of loss in extreme years. whereby: 1=no impact; 2=moderate; 3=sizeable; 4=serious and 5=very adverse.

While the majority of the respondents (55%) were in favour of a public-private insurance scheme, a substantial part of the respondents regarded these types of risks as a business risk which should be borne by the farmers themselves or considered the risks as not threatening for the continuity of their farm (table 2).

Table2: Importance of crop insurance.

	Percentage [a]		
	All respondents	≤50 ha	>50 ha
Important, whole-farm approach. Demand is depending on coverage and premiums	16	13	20
Important, for one or more crops. Demand is depending on coverage and premiums	29	22	39
Important, expectation is that ad hoc disaster relief is abandoned	10	10	9
Not important, ad hoc disaster relief will be issued under severe adverse conditions	3	3	3
Not important, part of normal income fluctuations	36	44	25
Not important, other reasons	6	8	4
Total	100	100	100

[a] One answer per respondent possible.

The demand for a hypothetical insurance scheme can be measured with the contingent valuation method. In the current approach the insurance demand was elicited by means of a willingness-to-pay format in which the respondents were asked to fill in the maximum amount of premium they were willing to pay per 1,000 Euro insured sum. The proposed multi-peril insurance program embraced a deductible of 25% of the insured sum. This relative high deductible was proposed since the coverage provided should preferably take the form of continuity insurance rather than a cover that indemnifies relative insignificant losses at farm level. Such a design would reduce problems with respect to moral hazard and also would prevent excessive loss appraisal costs.

The survey showed that in the sub-sample comprising large arable farms two thirds of the farmers are interested in crop insurance. Among small farms there is a somewhat lesser interest (i.e. 45%). Interest declines considerably if the premium exceeds 15 Euros per 1,000 Euros insured sum (table 3). Among those interested in crop insurance 23% is prepared to pay a premium more than 15 Euros per 1,000 Euros insured sum. A premium within the range of 15 – 20 Euros is considered necessary for launching an economically viable insurance scheme.

Table 3: Maximum premium willing to pay

	Percentage		
	All respondents interested	≤50 ha	>50 ha
0 - 10 € per 1,000 € insured sum	43	45	42
10 - 15 € per 1,000 € insured sum	34	32	35
15 - 20 € per 1,000 € insured sum	19	18	20
20 - 25 € per 1,000 € insured sum	4	5	3
Total (N = 180)	100	100	100

Arable farmers are particularly interested to have the option to insurance only a portion of the crops tilled. The insurers however indicated that insurance at farm level is desired to prevent anti-selection (only the most risky crops and plots are offered for insurance). Arable farmers realise that collectivity is important

because they state their preference for a mutual organisation form and feel that their representatives should also take the initiative in launching crop insurance (table 4).

For those respondents who were interested results suggest that a public involvement to subsidize crop insurance is essential for successful implementation. Respondents also stressed the importance of the level of the deductible and other aspects related to the design of the public-private insurance scheme, e.g. mutual insurance in which the government is acting as a re-insurer. The government would only provide reinsurance in the form of a stop loss contract, in which the maximum amount of loss that the insurance company will retain is specified. The government would only retain the upper part of the loss exposure in infrequent and severe adverse weather conditions. Farmers also feel that there should be more harmonisation between the various schemes in Europe and the extent of government support. A few arable farmers expect the government to act as guarantor for major disasters (table 4).

Table 4: Important stakeholders and public role

Important participants	Percentage [a)]		
	all respondents	≤50 ha	>50 ha
Sector via mutual	41	37	46
EU	23	21	26
National government	33	33	34
Interest groups of arable farmers	48	46	50
Dutch association of insurers	29	27	30
Banks	19	14	26
Others	2	3	2
Public role	Percentage [b)]		
Dispensation tax on premiums	22	24	19
Coverage tail risk	49	47	51
Subsidising premiums	18	17	21
Possibility tax free savings account	43	34	54
Otherwise	0	0	1
No public role	12	12	12

[a)] More stakeholders per respondent possible. [b)] Maximum two alternatives possible per respondent.

Summary and Implications

Up to now, risk transfer for crop related weather risks is only available for hail, storm and precipitation in the Netherlands. There is increasing political pressure to extend the possibilities for risk transfer for other weather risks. By means of a survey among arable farmers the interest for a more extensive multi-peril crop insurance is studied. Crop insurance should preferably take the form of continuity insurance with a high deductible (around 25% of the insured sum) rather than a cover that indemnifies relative insignificant losses at farm level. The survey showed that two thirds of farmers with large arable farms are interested in crop insurance. Among small farms there is less interest, i.e. 45%. Interest declines considerably if the premium exceeds 15 Euros per 1,000 Euros insured sum. Among those interested in crop insurance 23% is prepared to pay a premium of over 15 Euros per 1,000 Euros insured sum (a premium which is considered necessary for launching an economically viable insurance scheme). Arable farmers are particularly interested to have the option to insurance only a portion of the crops tilled. The insurers however indicated that insurance at farm level is desired to prevent anti-selection (only the most

risky crops are insured). The level of the premium is vital to the success or failure of crop insurance. Government participation is desirable here particularly in the form of enabling re-insurance. Farmers also feel that there should be more harmonisation between the various schemes in Europe and the extent of government support. Without the involvement of the government weather insurances are too expensive to be successful.

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