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Risk barometers to assess whole-farm risk positions

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Farm-specific whole-farm analysis

Analysing the trade-offs in risk and returns of alternative farm plans and evaluating the merits of risk-reducing instruments requires a method of farm-specific whole-farm analysis. To support decision making an Internet tool has been developed for farmers who assess the (relative) riskiness of (alternative) farm plans.

Portfolio modelling approach

The portfolio modelling approach is often used to show how different combinations of assets may reduce an investors' risk more than having a single activity. When applied to agricultural businesses, the notion of portfolio modelling is extended to include alternative cropping activities, price contract arrangements and financing alternatives. The classical portfolio approach is based on mean-variance (E,V) programming. This method restrictively uses the first two moments (i.e. mean and variance) of each risky activity and the first co-moment (i.e. covariance) between the risky activities.

Assessing risk position

Means, variances and covariances of detrended yields and deflated prices are estimated from the Farm Accountancy Data Network (FADN). Based on the farmers stated production plan, farm characteristics and preferred risk management strategies, the joint distribution of the household income is analytically computed. Risk on the barometer scale is approximated with the coefficient of variation (CV), whereby CV = (Standard deviation of household income / Expected household income) * 100.

Risk barometer

A risk barometer enables the assessment of the farm-specific whole-farm risk position and a sensitivity analysis of alternative farm plans. The risk barometer is available on-line, free of charge, for arable producers (www.risicobarometer.nl/), and poultry farmers (www.agrocenter.nl/Pluimvee/MainPluimvee.htm).

Input: Example cropping portfolio characteristics.

Cropping portfolio	Hectares	Expected yield	Yield volatility	Contract
Consumption potatoes	15	Average	Average	No price contract
Seed potatoes	0			
Bulbs	0			
Winter carrot	0			
Seed unions	0			
Planting unions	0			
Winter wheat	15	Average	Average	No price contract
Summer barley	10	Average	Average	No price contract
Grass seed	0			
Beans	0			
Sprouts	0			
Sugar beet	10	Average	Average	No price contract
Flax	0			
Cabbage	0			
Other crops	0			

Input: Example other farm characteristics.

Soil type	Clay	
Land ownership	50	Hectare
Land rented out	0	Hectare
Percentage of debt with variable interest rate	100	%
Percentage of debt with 5-year fixed interest rate	0	%
Percentage of debt with 10-year fixed interest rate	0	%
Disability insurance	No	
Solvency (as measure of leverage position)	70	%
Additional assets	75,000	Euro
Additional income stemming from other farm activities	5,000	Euro
Annual off-farm income	5,000	Euro

Output: Example whole-farm position.

Output: Sensitivity analysis alternative input assumptions.

	Outcome risk barometer (CV)
Example farm (default assumptions)	147
Lowest expected yields versus default expected yields	200
Highest expected yields versus default expected yields	123
Highest yield variability versus default yield variability	162
Pooled price contract consumption potatoes versus no contract	132
Sovency 50% versus 70%	171
Sovency 90% versus 70%	122
Off-farm income 25,000 Euro versus 5,000 Euro	120

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