WIFO ÖSTERREICHISCHES INSTITUT FÜR WIRTSCHAFTSFORSCHUNG
AUSTRIAN INSTITUTE OF ECONOMIC RESEARCH

BUNDESANSTALT für Agrarwirtschaft
FEDERAL INSTITUTE of Agricultural Economics

A prototype of an index-based margin insurance for agriculture in Austria

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WIFO

Contents of the presentation

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- **agricultural production risk management in Austria**
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  - **weaknesses and a proposal for a solution: margin index insurance**
- **necessary conditions for a margin insurance to work**
- **concept and prototype**
- **discussion and outlook**

motivation and problem statement

motivation and problem statement

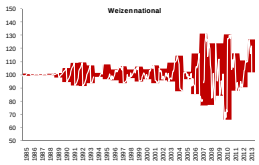
- farm structure in Austria and level of education
- challenges of price volatility
  - more uncertainty about revenues and costs
  - specialisation and liquidity problems – not alleviated by EU direct payments
  - political measures: late, uncertain, no legal title, wrong incentives
  - tax credits – not relevant in Austria for most farms
  - price hedging instruments steep learning curve and intransparent markets
  - most frequently used: service of buying co-operatives

what is a margin insurance




nature ← hail, flood, drought

market ← price volatility



management ← quality

management

t yield/ha x **price €/t** = **revenue**

– **variable costs**

= **margin**

motivation and problem statement
types of income related insurance in Austria

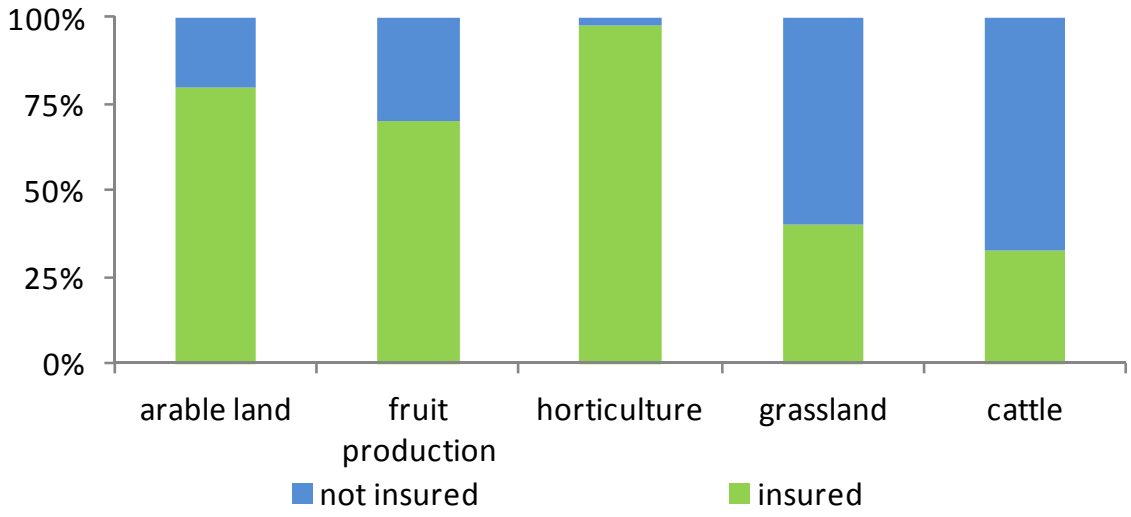
- **mandatory:**
  - unemployment insurance for employees
  - public disability and accident insurance
- **voluntary:**
  - unemployment insurance for self-employed persons (since 2009) – but not for farmers
  - private invalidity and disability insurance
  - private health insurance: daily allowances (additional coverage)
- all these insurances have special features to make them operational

agricultural production risk management in Austria

agricultural production risk management in Austria

	Hail	Consumer's risk due to hail	Hail induces fusarium infestation	Frost	Drought	Re-cultivation	Storm	Drift	Siltation (mud)	Flooding	Predation	Sprouting	Snow damage	Additional hassle and rot	Spoilage	Heavy rain	Death	Dead birth	Animal epidemics	Death failure of ventilation	Technical defects	Fire
cereals / grains	x			x	x			x	x	x	x	x										
maize	x		x		x		x	x	x	x	x		x									
Potatoes	x			x	x	x		x	x	x	x											
Rape	x			x				x	x	x	x											
Soy Bean	x				x			x	x	x	x											
Clover	x				x	x		x	x	x	x											
Other forage plants	x					x		x	x	x	x											
Fruit trees	x						x						x									
Apples	x			x	x																	
Grapes	x			x										x								
Glasshouse	x						x			x			x		x						x	x
Tree nursery	x			x			x			x			x		x							
Cattles																	x	x	x			
Pigs																			x	x		

agricultural production risk management in Austria



agricultural production risk management in Austria

Key data on the market for production related risks in Austrian agriculture

	2000	2005	2014
clients	71,897	67,866	n.a.
area, 1,000 ha	913	1,079	1,209
premium volume, mn €	45.9	53.1	96.3
farmer's losses, mn €	64.3	23.3	n.a.
premium subsidy, mn €	22	24	40
amount covered, bn €	**n.a.**	**n.a.**	**3.7**

necessary conditions for an income related insurance to work

necessary conditions for an income insurance in agriculture to work

- low administrative costs
  - mutual insurer
  - index based system on margins instead of personal income
- avoid adverse selection: self selection into well designed product
- avoid moral hazard: farmer's behaviour has no effect on outcome - index
- avoid accumulation risk
  - diversified farm products / inputs of which prices are uncorrelated
  - re-insurance
- no unconditional insurance of structural shifts:
  - limited payout period, regular renegotiation of insurance contract
  - automatic adaptation of premiums / indemnity levels

the concept and a prototype

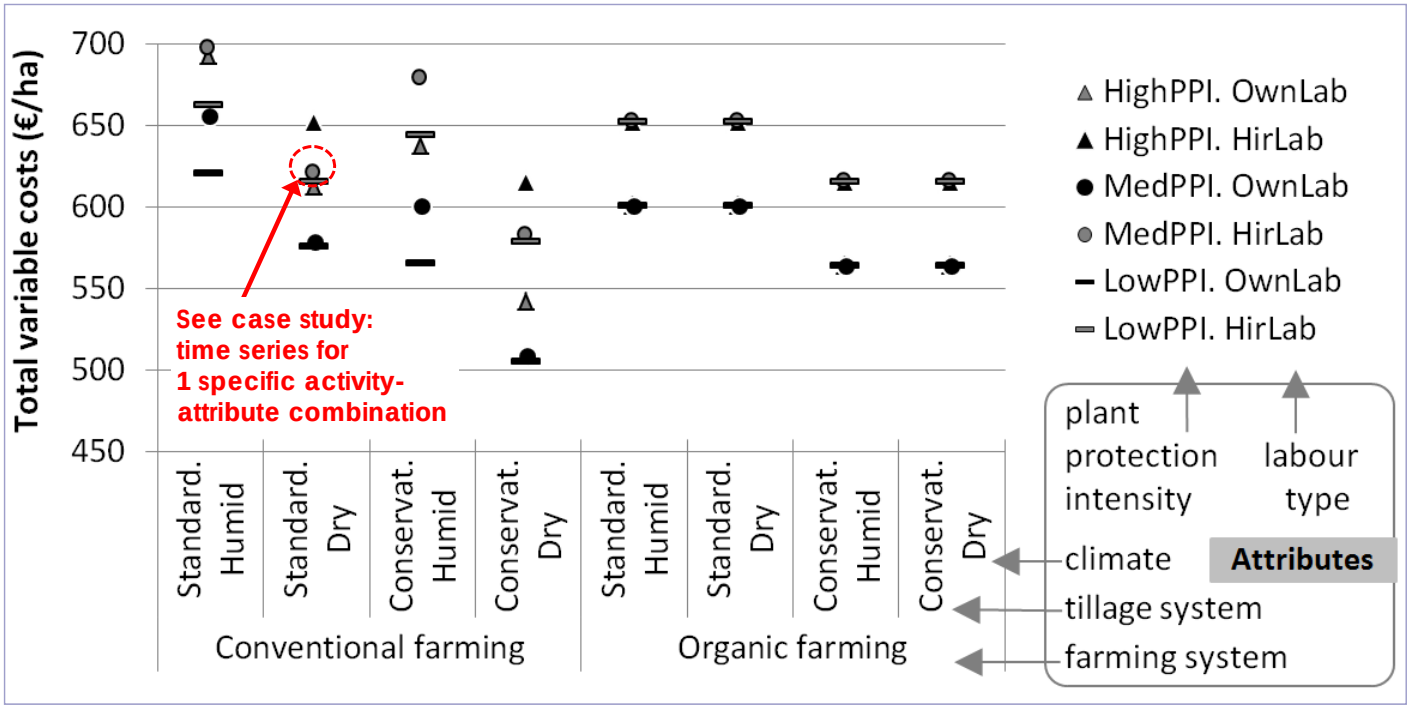
introduction to INCAP
index based costs of agricultural production

INCAP		INCAP consists of 2 activity groups.
Plant production activities **(INCAP.p)**	**Livestock activities** **(INCAP.l)**	← **Activity groups**
Cereals, oilseeds, protein crops, root crops, catch crops, fallow land, silage, hay	Dairy cow and milk prod., heifer rearing, bull fattening, suckler cow + beef calf prod., piglet production, pig fattening	← **Activity types**

introduction to INCAP
index based costs of agricultural production

Activity				Each activity has at least 3 dimensions.
Gross margin components	**Attributes**	**Time**	**Area**	← **Dimensions**
Revenue (e.g. grain, straw) Variable costs (e.g. seeds, fertiliser, plant protection)	Attribute types (e.g. farming system, tillage system, plant protection intensity, climate type, labour type)	Past/Present Future	Austria Provinces Communities	← **Differentiation** within the dimensions
Capture heterogenous production conditions and management systems	Capture heterogenous production conditions and management systems	Capture development over time	Allow spatially-explicit analyses	← **Purpose**

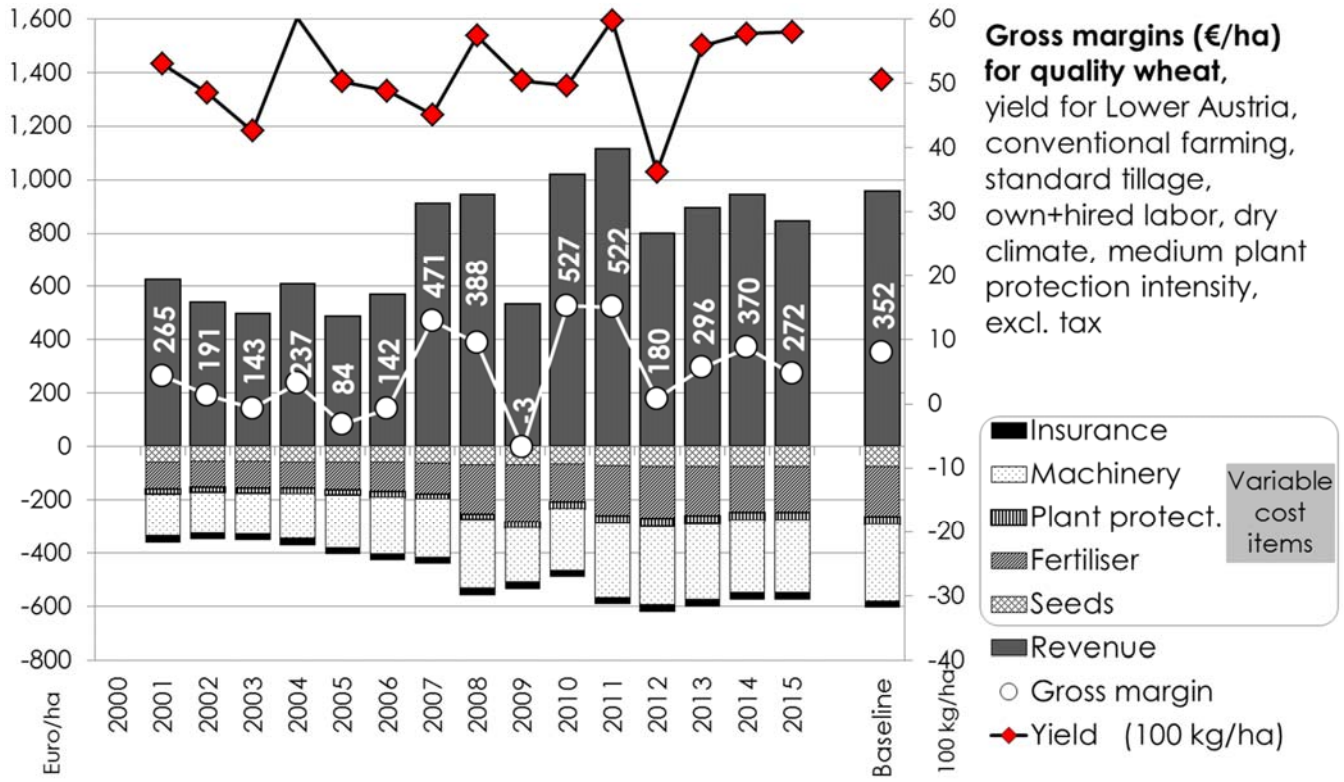
example
quality wheat, average 2011-2013



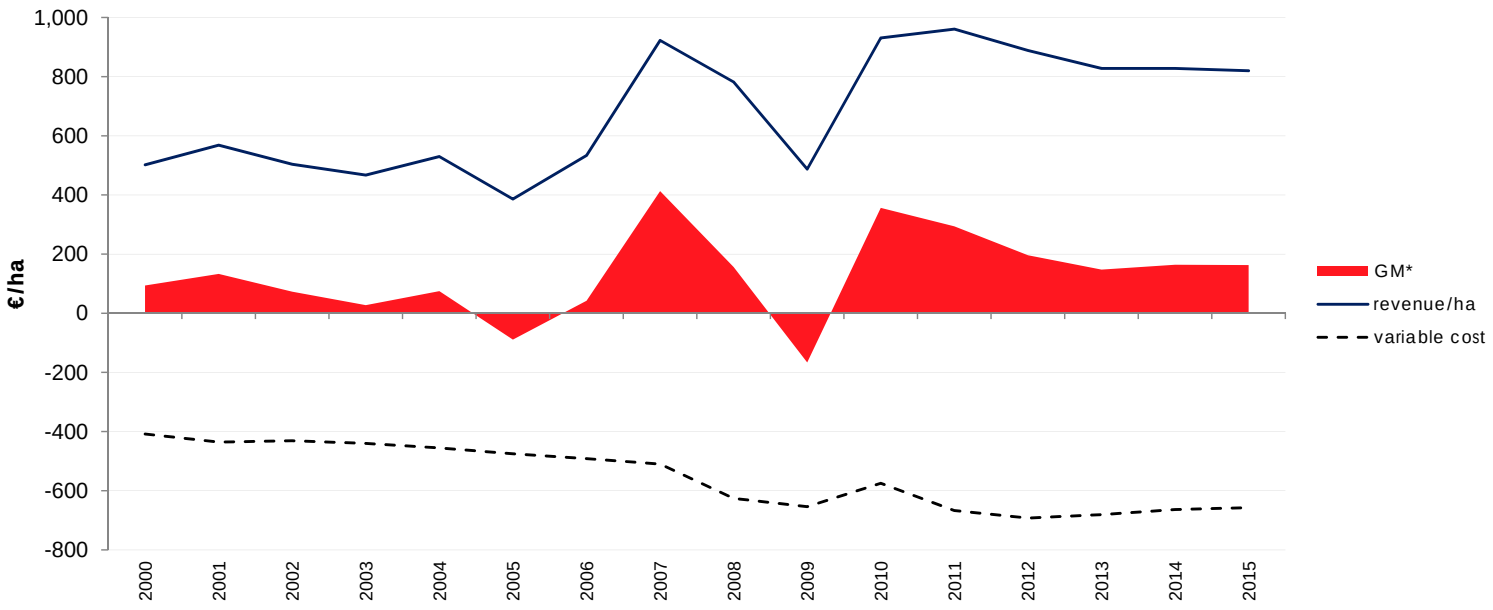
Variable costs for 48 combinations of quality wheat, no straw recovery, cropland, field size: 2ha, tax excluded) in the reference year (average 2011-2013), €/ha.

introduction to INCAP

time series for 1 specific quality wheat production activity



a protoype of a margin insurance quality wheat in Austria



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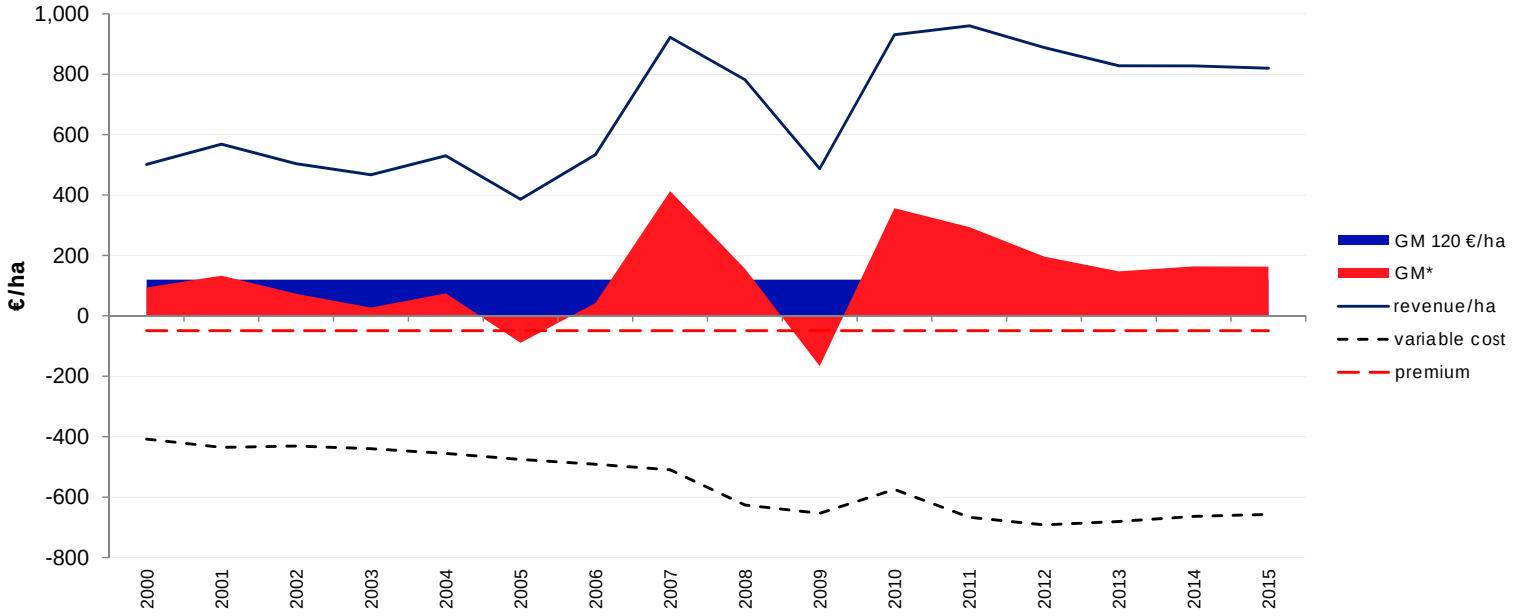
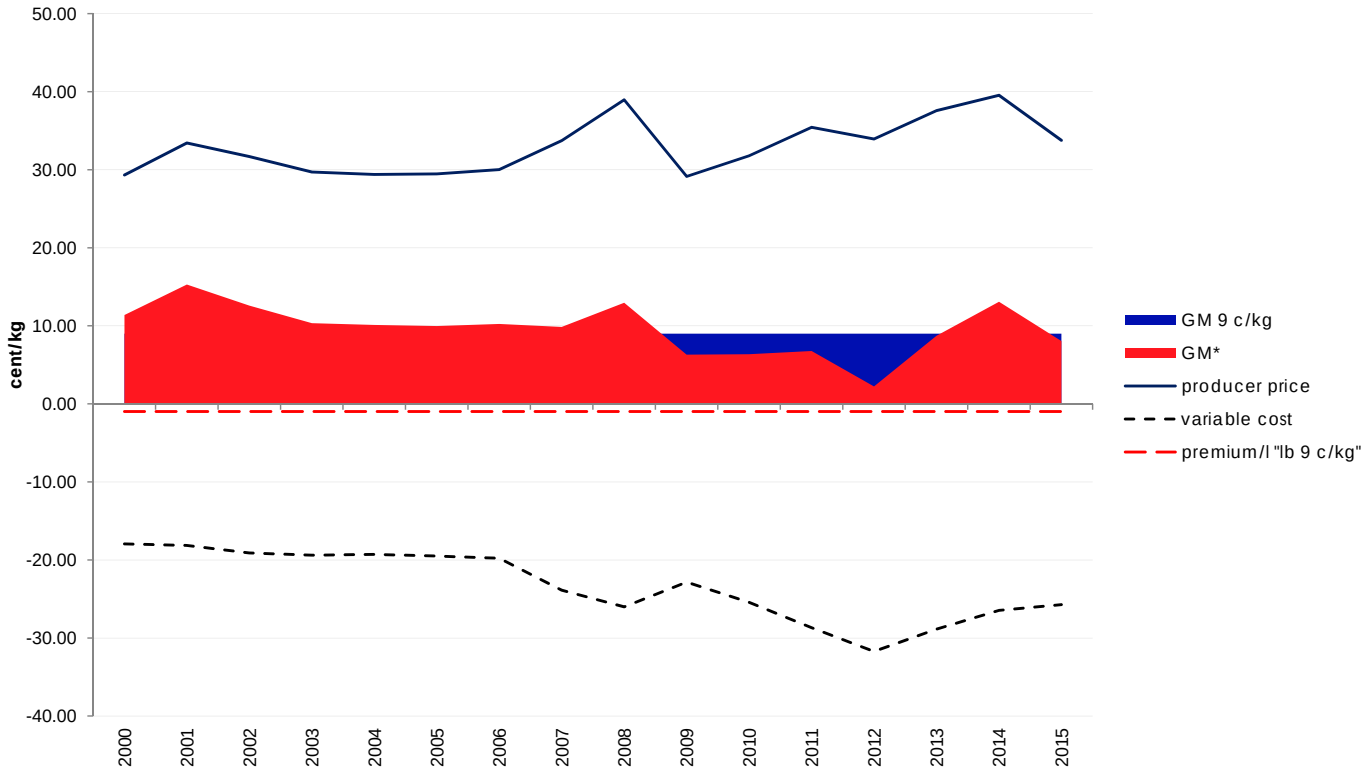


a protoype of a margin insurance (conventional) milk in Austria



discussion and outlook

deficiencies of the prototype and some open questions

- at the moment just a little more than a prove of concept
- farmers' reaction and willingness to pay not yet known
  - they may be interested in income insurance instead of margin insurance
  - variable costs are not very volatile for many activities: only a small group may be interested ➲ high accumulation risk
- not for all products / inputs there are adequate price indices available
- time series properties of candidate indices are not yet well understood

some sufficient conditions for an income insurance in agriculture to work

- control of accumulation risks
- details of contract are attractive for farmers
  - e.g. monthly benefits for milk producers
  - benefits at the time of sale for pig, piglet, grain producers
- combination with production risk insurance with discounts
- government support during introduction period / as a new policy instrument
- marketing and sales: wholesale buyers / dairies / producer organisations offer margin insurance as a service

the way ahead

- further validation of margin calculation tool
- research on adequate indices for various activities
- statistical properties / time series properties of relevant data
- development of more sophisticated prototypes for more activities
- micro-simulation of variants of products using data from existing firms
- farmers' willingness to pay for well designed products
- check of legal / agricultural policy context for such types of products

Thank you

credits

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literature

AWI (Federal Institute of Agricultural Economics) (2016).IDB Deckungsbeiträge und Kalkulationsdaten (Internet gross margins and data).URL: http://www.awi.bmlfuw.gv.at/idb/default.html (01.07.2016).

Heinschink, K., F. Sinabell, C. Tribl, 2016, An index-based production costs system to evaluate costs of adaptation and mitigation in dairy and cattle farming. Advances in Animal Biosciences, (2016), 7:3, pp 242–244 © The Animal Consortium 2016. doi:10.1017/S2040470016000285

Heinschink, K., Sinabell, F., F. Lembacher, 2016a, Crop production costs in Austria: Validation of simulated results using farm observations. 26th Annual Conference of the Austrian Society of Agricultural Economics, Wien

Heinschink, K., Sinabell, F., Tribl, C.,2016b Index-based Costs of Agricultural Production' (INCAP) – a new risk analysis tool for Austria. Paper presented at the Agricultural Economics Society Annual Conference 2016, 4 April 2016, University of Warwick, England.

Larcher, M., M. Schönhart, E. Schmid, 2015, Risikobewertung und Risikomanagement landwirtschaftlicher BetriebsleiterInnen in Österreich – deskriptive Befragungsergebnisse 2015. No 592016, Working Papers from Institute for Sustainable Economic Development, Department of Economics and Social Sciences, University of Natural Resources and Life Sciences, Vienna

Orden, D., Zulauf, C., 2015, Political Economy of the 2014 Farm Bill. American Journal of Agricultural Economics 97 (5): 1298-1311.

Scharner, M., S. Pöchtrager, 2016, Ökonomische Betrachtung von Einkommensversicherungen für österreichische Milchproduzenten. Tagungsband . 26. Jahrestagung der Österreichischen Gesellschaft für Agraröknomiie, Wien.

Sinabell, F., K. Heinschink, Ch. Tribl, 2016, Explicit cost accounting for analyses on climate change adaptation, mitigation and ecosystem service provision in agriculture In: Sauvage, S., Sánchez-Pérez, J.M., Rizzoli, A.E. (Eds.) 2016. Proceedings of the 8th International Congress on Environmental Modelling and Software, July 10-14, Toulouse, FRANCE. ISBN: 978-88-9035-745-9.

Sinabell, F., Th. Url, Martin Kniepert und F. Strauss, 2010, Agrarpolitische und betriebswirtschaftliche Optionen zum Risikomanagement in der österreichischen Landwirtschaft (policy options and management strategies to cope with risks in Austrian agriculture). Studie des Österreichischen Instituts für Wirtschaftsforschung im Auftrag des Bundesministeriums für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft. Wien, 2010.

Url Th. and F. Sinabell, 2008, Flood risk exposure in Austria – options for bearing risk efficiently. Schmollers Jahrbuch: Journal of Applied Social Science Studies / Zeitschrift für Wirtschafts- und Sozialwissenschaften, Vol 128 (4) 593-614, 2008.