

An Index-Based Margin Insurance for Agriculture: Wheat Production in Austria

Franz Sinabell¹, Thomas Url¹, Karin Heinschink²

³ Austrian Institute of Economic Research, Arsenal Object 20, 1030 Vienna, Austria

² Federal Institute of Agricultural Economics, Marxergasse 2, 1030 Vienna, Austria

Risk in the food economy – theory and practice

IAFE-NRI Conference

Warsaw, 24 November 2016

Contents of the presentation

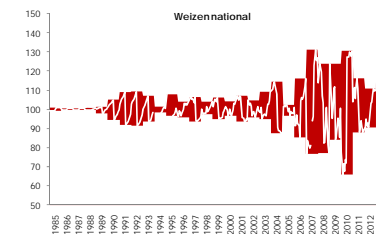
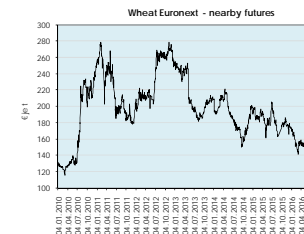
- motivation and problem statement
- INCAP – a tool for cost accounting
 - concept
 - application
- **index** based **margin-insurance** for crop producers: a prototype
 - necessary conditions for a margin insurance to work
 - concept, prototype, application
- discussion and outlook

motivation and problem statement:

farm income volatility and adaptation to climate change

- farm structure in Austria and level of education
- challenges of more volatile markets / more uncertain yields
 - more uncertainty about **revenues** and **costs**
 - specialisation and **liquidity** problems – not alleviated by EU direct payments
 - political measures: late, uncertain, no legal title, biased incentives
 - tax credits – not relevant in Austria for most farms
 - price hedging instruments steep learning curve and intransparent markets

what is a margin insurance



nature



management



t yield/ha

hail
flood
drought



market



management



price €/t



price volatility



quality

↑
quantity

x

= revenue
- variable costs

= margin

necessary conditions for an
effective income-related insurance to work

necessary conditions for an income insurance in agriculture to work

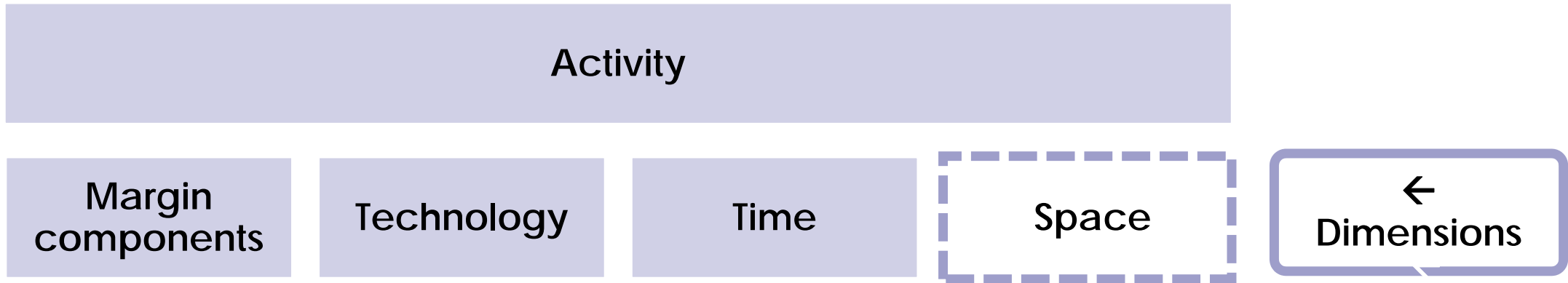
- low **administrative costs**
 - mutual insurer
 - **index** based system on **margins** instead of **personal income**
- avoid **adverse selection**: self-selection into well designed product
- avoid **moral hazard**: farmer's behaviour has no effect on outcome – **index**
- avoid **accumulation risk**: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

INCAP

the concept and a prototype
of a margin insurance

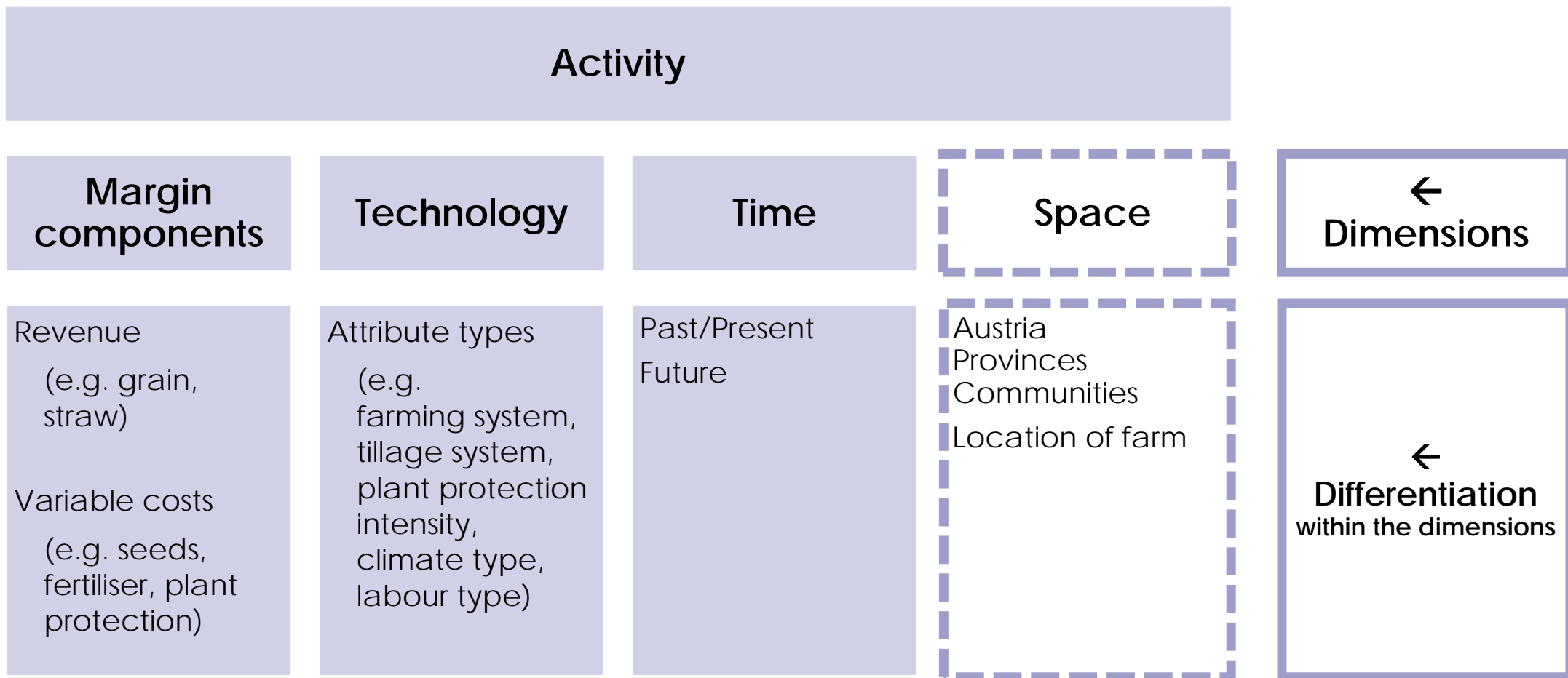
introduction to INCAP

index based costs of agricultural production



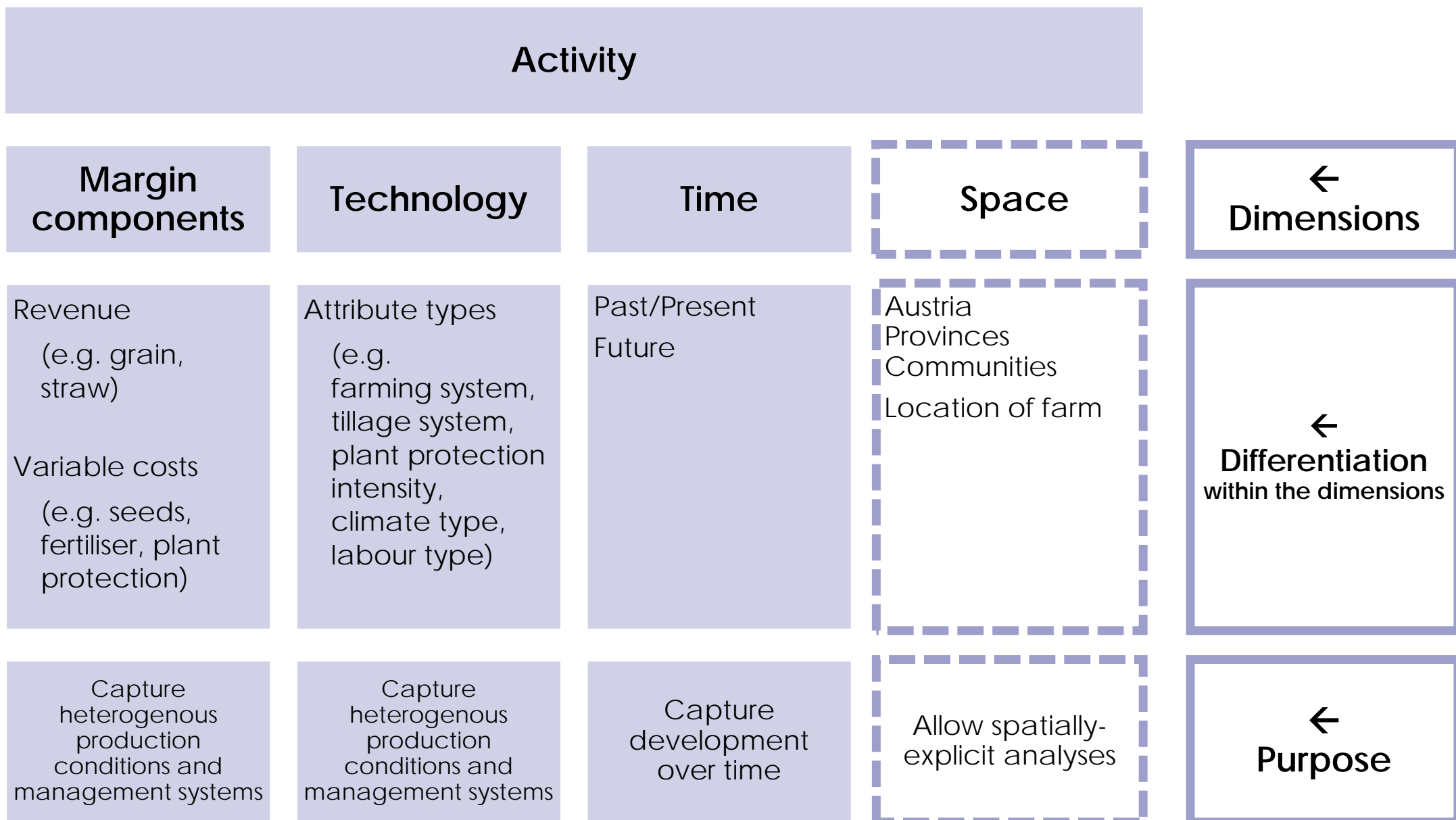
introduction to INCAP

index based costs of agricultural production



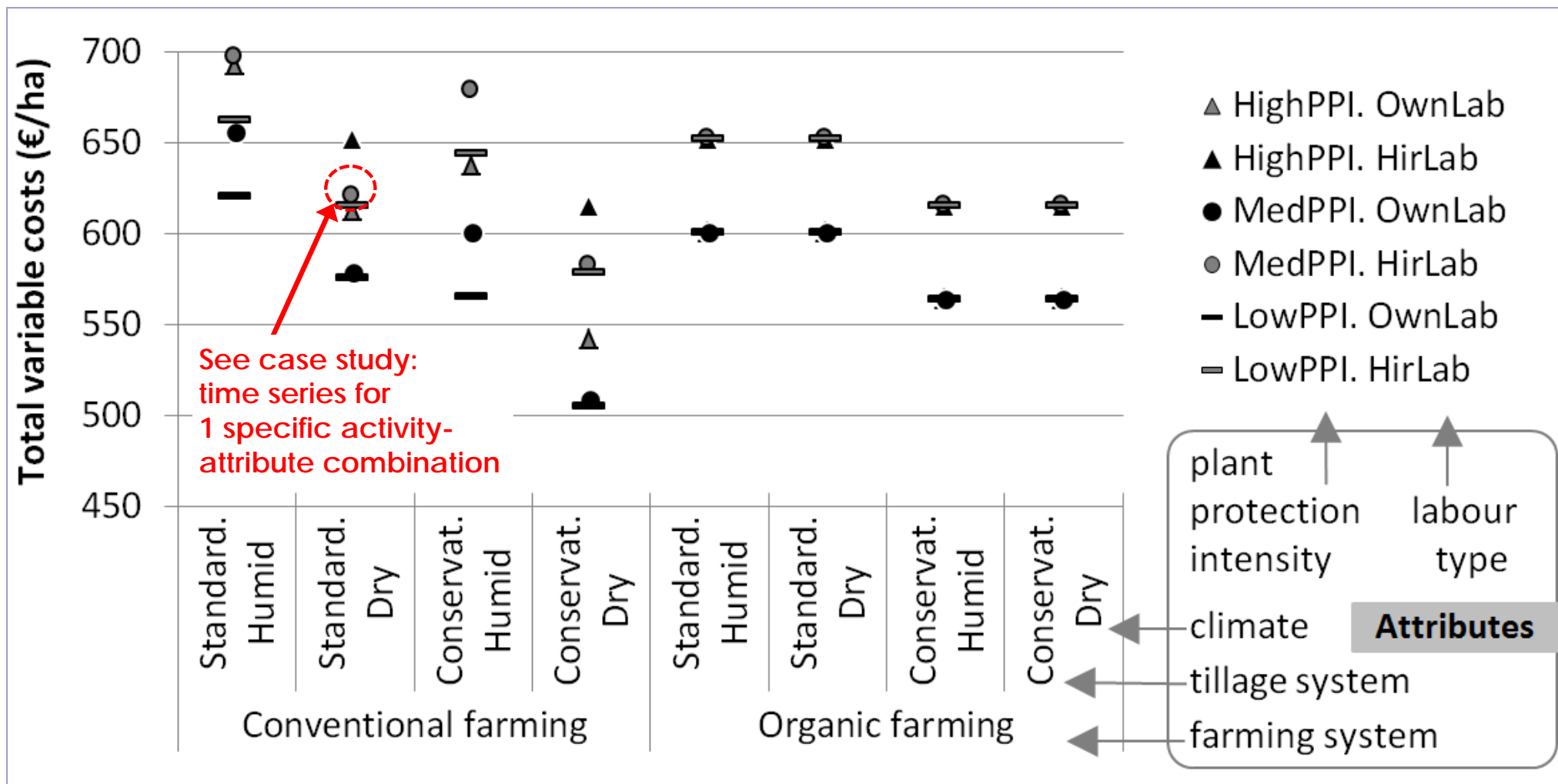
introduction to INCAP

index based costs of agricultural production



example

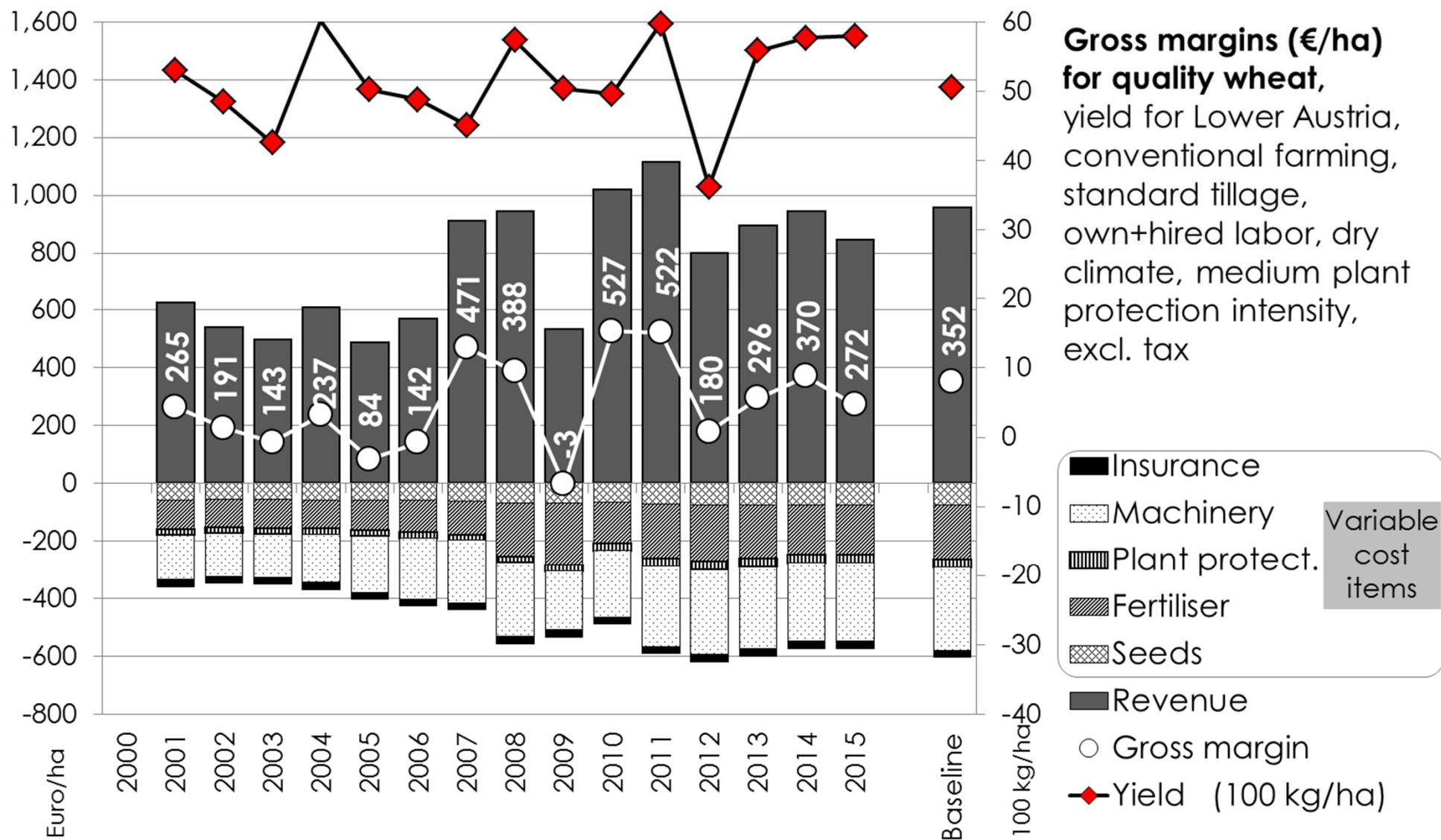
quality wheat, average 2011-2013



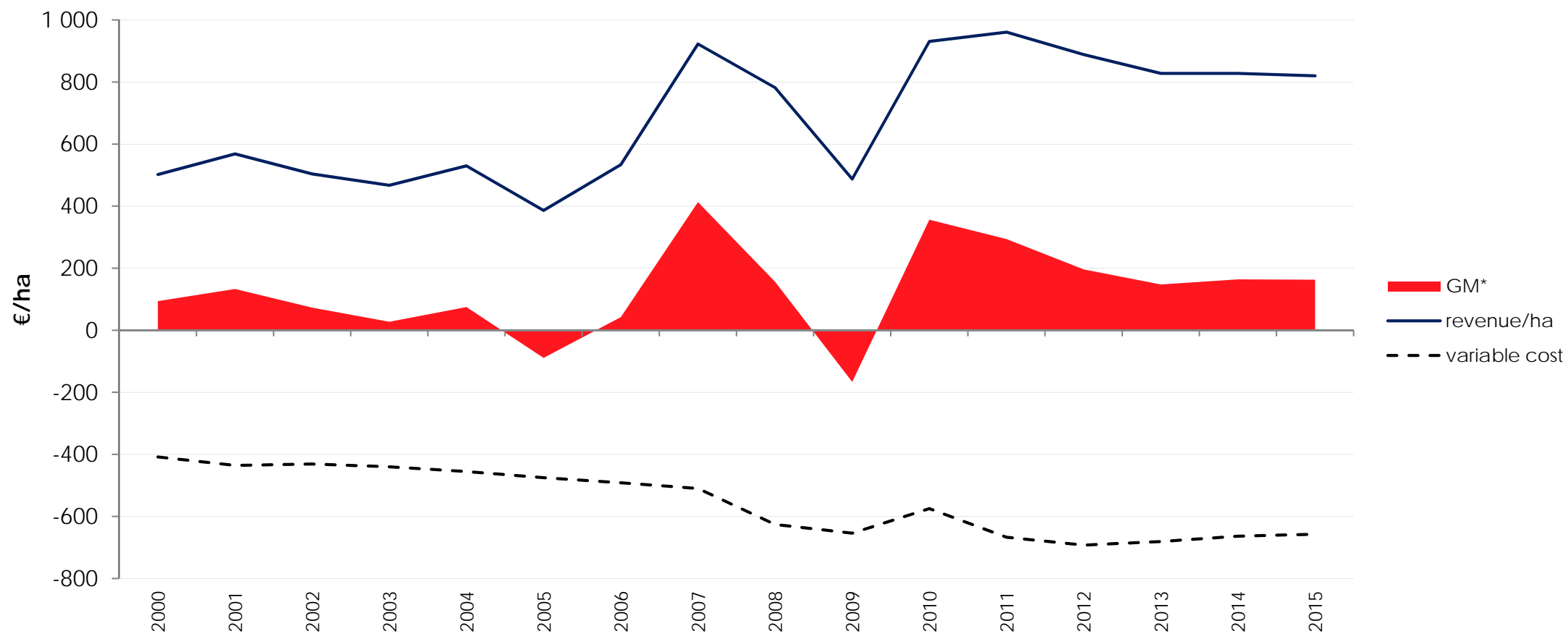
Variable costs for 48 combinations of quality wheat, no straw recovery, cropland, field size: 2ha, tax excluded) in the reference year (average 2011-2013), €/ha.

introduction to INCAP

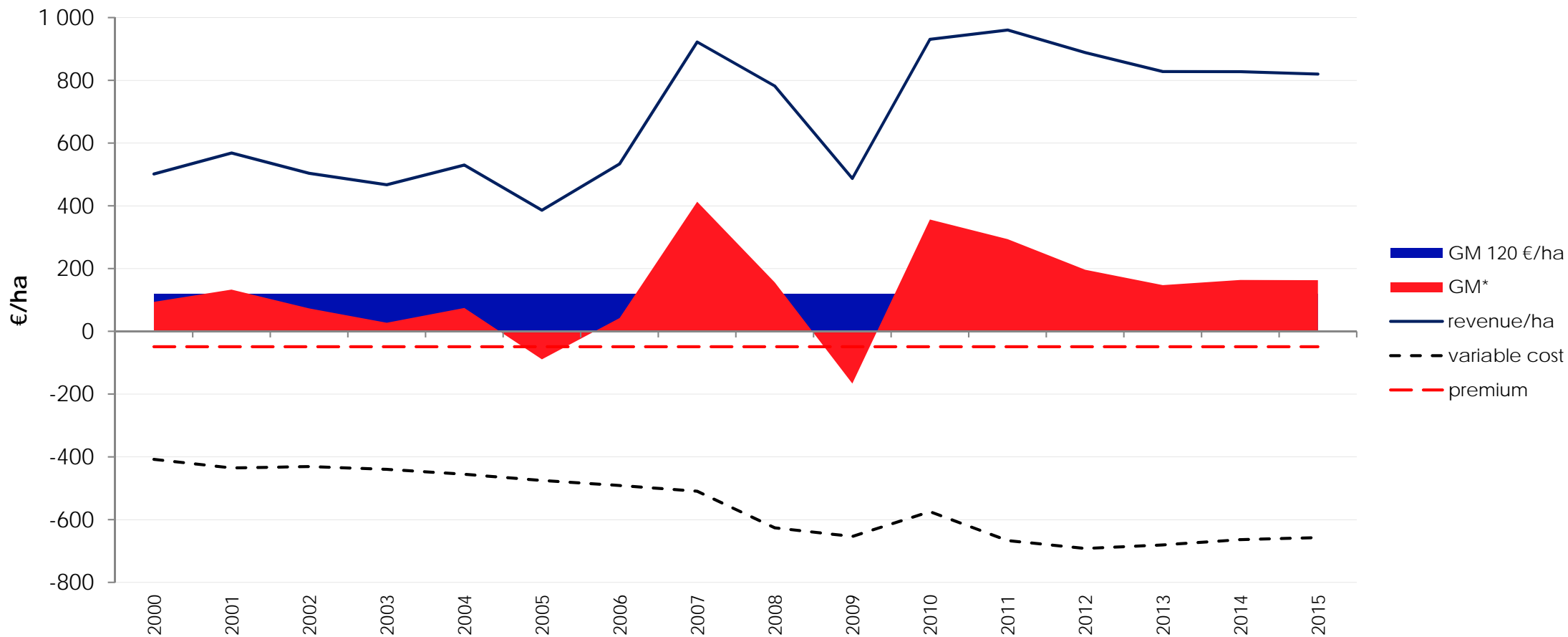
time series for 1 specific production activity of quality wheat



a prototype of a margin insurance quality wheat in Austria: average for whole country



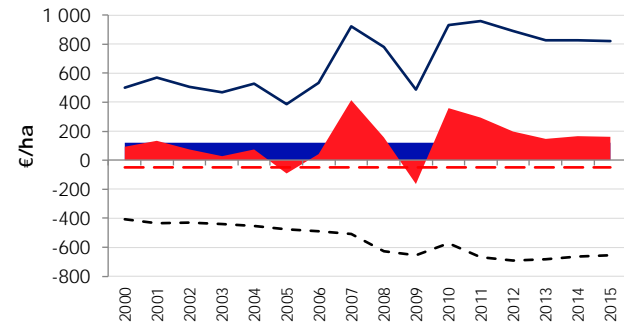
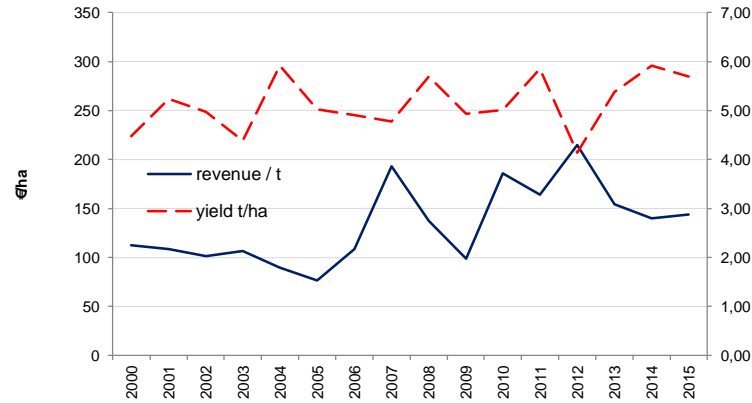
a prototype of a margin insurance quality wheat in Austria: average of whole country



annual fair premium: 49 €

different states of nature / market

A: average
2000 - 2015

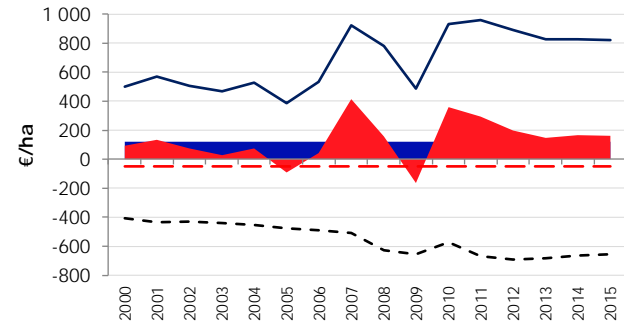
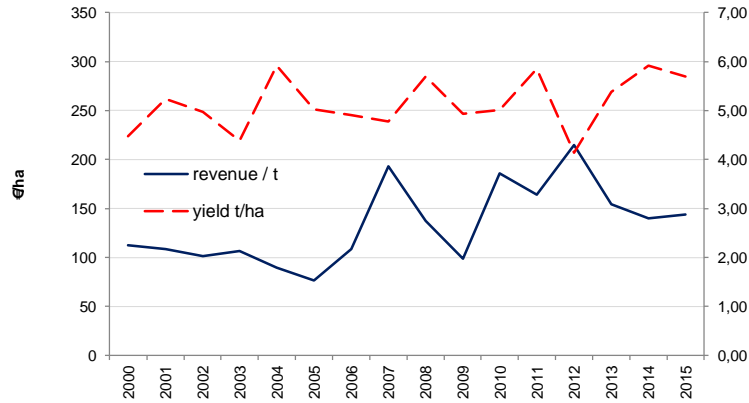


fair
premium

A: 49 €

different states of nature / markets

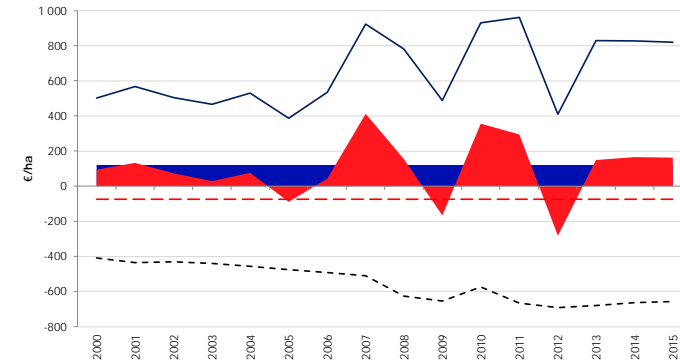
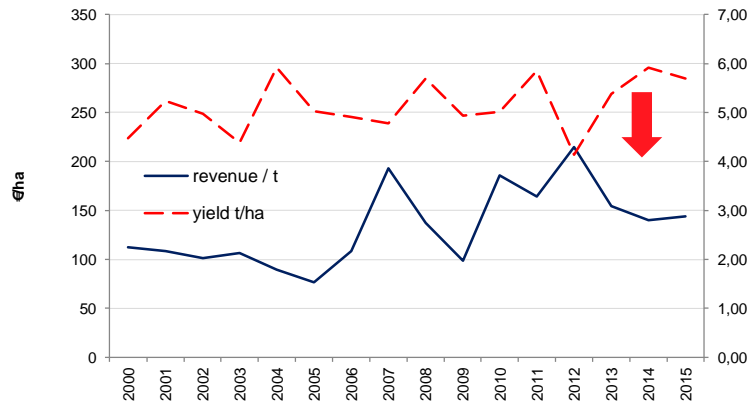
**A: average
2000 - 2015**



**fair
premium**

A: 49 €

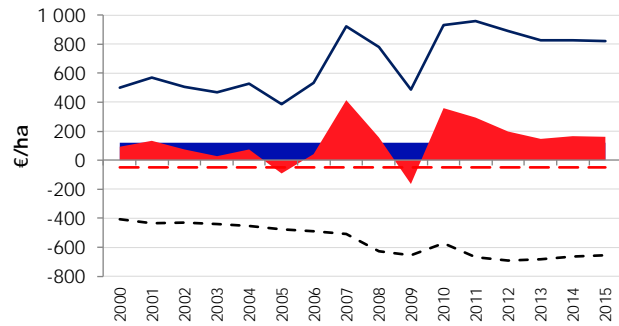
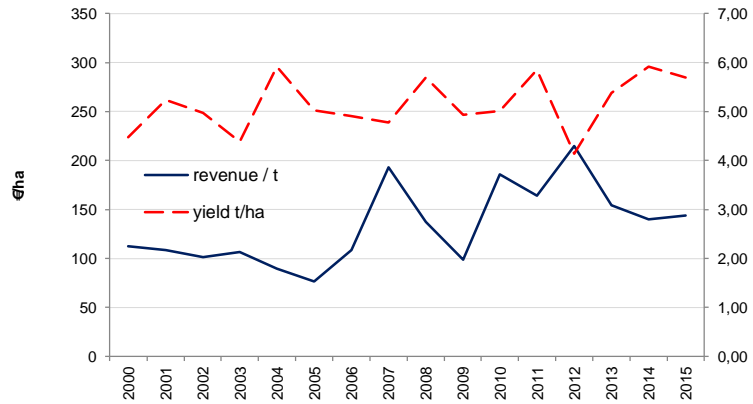
**B: bad harvest
in 2013**



B: 59 €

different states of nature / markets

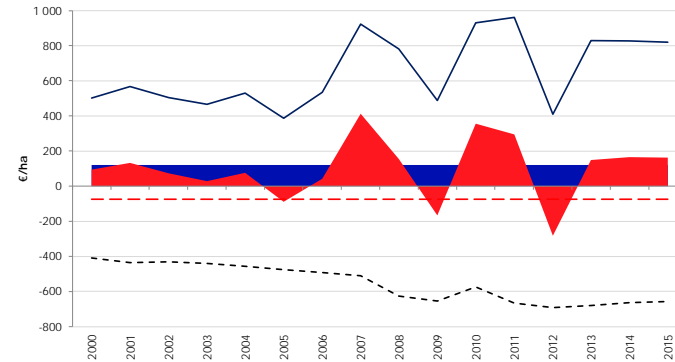
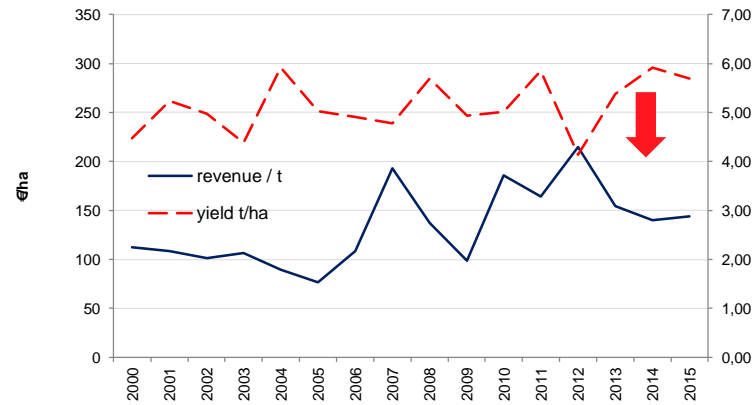
**A: average
2000 - 2015**



**fair
premium**

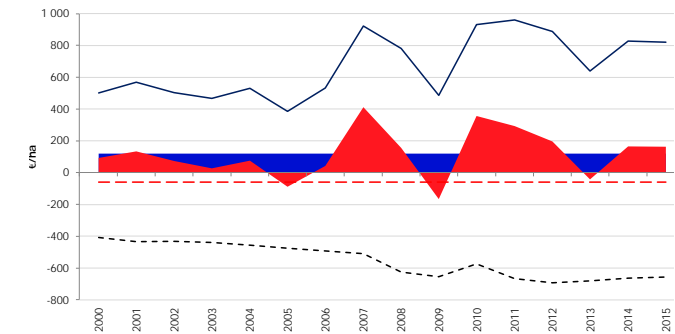
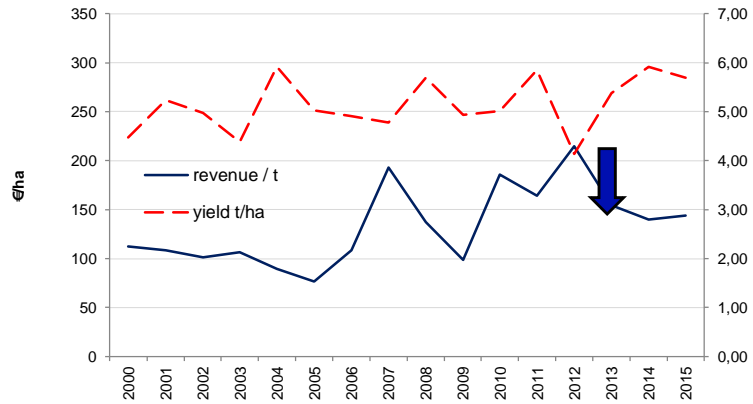
A: 49 €

**B: bad harvest
in 2013**



B: 59 €

**C: crash of
market prices
in 2012**



C: 69 €

different types of farmers



A: average



**B: best
price +5%,
harvest +10%**



**C: careless
price -5%,
harvest -10%**

different types of farmers



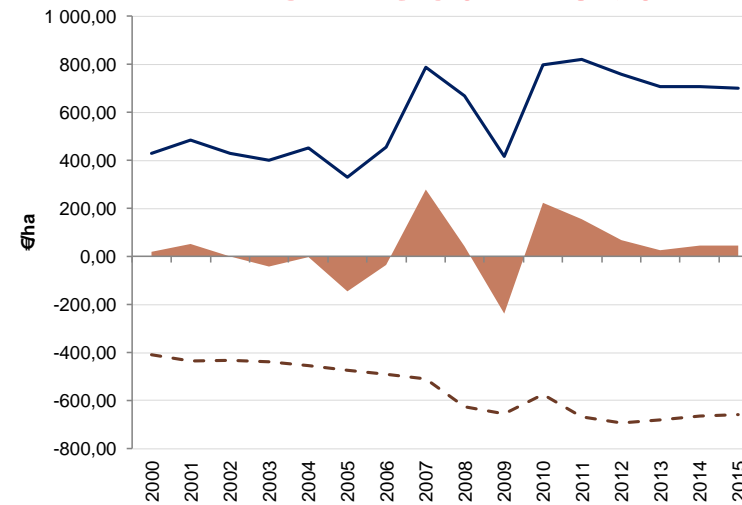
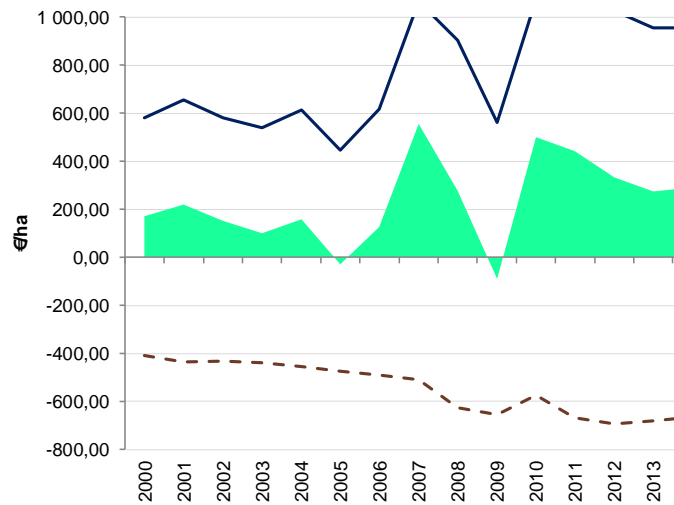
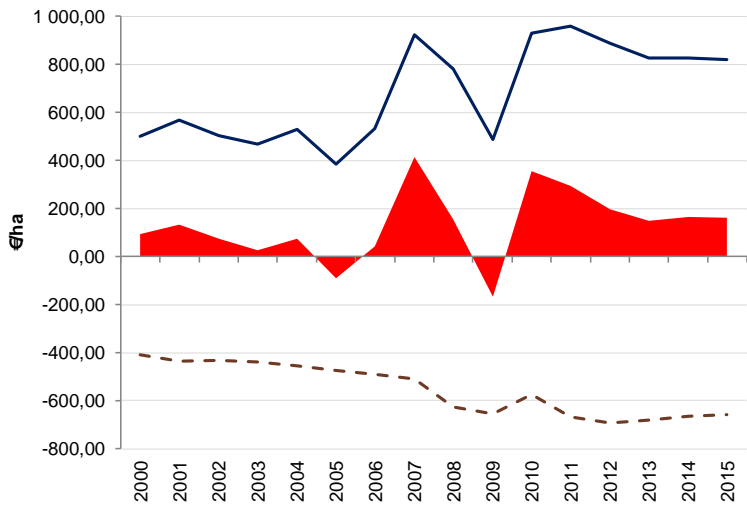
A: average



**B: best
price +5%,
harvest +10%**



**C: careless
price -5%,
harvest -10%**



different types of farmers



A: average

B: best
price +5%,
harvest +10%C: careless
price -5%,
harvest -10%

harvest	t / ha		134	140	127
yield	kg/ha		5 145	5 659	4 630
revenue*	€ / ha	1	684	790	585
revenue+indemnity	€ / ha	2	733	839	634
costs	€ / ha	3	554	554	554
premium	€ / ha	4	49	49	49
GM*	€ / ha	1-3	130	236	31
GM	€ / ha	2-3-4	130	236	31

different types of farmers



A: average



**B: best
price +5%,
harvest +10%**



**C: careless
price -5%,
harvest -10%**

harvest	t / ha		134	140	127
yield	kg/ha		5 145	5 659	4 630
revenue*	€ / ha	1	684	790	585
revenue+indemnity	€ / ha	2	733	839	634
costs	€ / ha	3	554	554	554
premium	€ / ha	4	49	49	49
GM*	€ / ha	1-3	130	236	31
GM	€ / ha	2-3-4	130	236	31

discussion and outlook

deficiencies of the prototype and some open questions

- at the moment just a little more than a prove of concept
- farmers' reactions 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
- adequate price indices *not* available for all products / inputs
- time series properties of candidate indices are not yet well understood

the way ahead

- research on adequate **indices** for various activities
- statistical properties / **time series properties** of relevant data need to be better explored
- development of more sophisticated prototypes for **more activities**
- **micro-simulation** of variants of products using data from existing firms
- estimate farmers' **willingness to pay** for well designed products
- check of **legal** / agricultural policy context for such types of products
- gain better understanding of market related **volatility** at global level

Thank you for your attention

credits

Financial support provided by

Austrian Climate and Energy Fund of the Austrian Federal Government,
Contract B368569 of ACRP 6 ADAPT-CATMILK KR13AC6K11112

Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management (BMLFUW),
Project 101114 – FACCE Knowledge Hub MACSUR 2

decoration

<http://www.computerwoche.de/a/weichen-fuer-das-smart-farming-werden-gestellt,3224966>

<http://foodtank.com/news/2015/07/to-attract-young-farmers-offer-financial-support>

<http://www.shaunthesheep.com/>



The Climate and Energy Fund of the Austrian
Federal Government



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> (accessed 01.07.2016).
- Heinschink, K., Sinabell, F., Tribl, C. (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), 242–244 © The Animal Consortium 2016. doi:10.1017/S2040470016000285
- Heinschink, K., Sinabell, F., Lembacher, F. (2016). Crop production costs in Austria: Validation of simulated results using farm observations. In: *Co-operation between Research and Practice – A key to competitiveness and innovation in agriculture?*, proceedings of the 26th Annual Conference of the Austrian Society of Agricultural Economics, 15-16 September 2016, Vienna, Austria. URL: http://oega.boku.ac.at/fileadmin/user_upload/Tagung/2016/Short_Papers_2016/OEGA_TAGUNGSBAND_2016.pdf (accessed 21.11.2016).
- Heinschink, K., Sinabell, F., Tribl, C. (2016). 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., Schönhart, M., Schmid, E. (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, Austria.
- Orden, D., Zulauf, C. (2015). Political Economy of the 2014 Farm Bill. *American Journal of Agricultural Economics* 97 (5): 1298-1311.
- Scharner, M., Pöchtrager, S. (2016). Ökonomische Betrachtung von Einkommensversicherungen für österreichische Milchproduzenten. In: *Co-operation between Research and Practice – A key to competitiveness and innovation in agriculture?*, proceedings of the 26th Annual Conference of the Austrian Society of Agricultural Economics, 15-16 September 2016, Vienna. URL: http://oega.boku.ac.at/fileadmin/user_upload/Tagung/2016/Short_Papers_2016/OEGA_TAGUNGSBAND_2016.pdf (accessed 21.11.2016).
- Sinabell, F., Heinschink, K., Tribl, C. (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*, 10-14 July 2016, Toulouse, France. ISBN: 978-88-9035-745-9.
- Sinabell, F., T. Url, M. Kniepert, Strauss, F. (2010). Agrarpolitische und betriebswirtschaftliche Optionen zum Risikomanagement in der österreichischen Landwirtschaft (policy options and management strategies to cope with risks in Austrian agriculture). Study prepared by the Austrian Institute of Economic research, commissioned by the Federal Ministry of Agriculture and Forestry, Environment and Water Management. Vienna, Austria. URL: <https://www.bmlfuw.gv.at/dam/jcr:709b4c50-8bb7-4639-83b4-05881dae5239/Studie%20Risikomanagement%20.pdf> (21.11.2016).
- Url, T., Sinabell, F. (2008). Flood risk exposure in Austria – options for bearing risk efficiently. *Schmollers Jahrbuch: Journal of Applied Social Science Studies / Zeitschrift für Wirtschafts- und Sozialwissenschaften* (2008), 128 (4), 593-614.

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