ADAPTING NATIONAL RISK TRANFER SYSTEMS:

How much regulation for the insurance markets?

Franz Prettenthaler, Nadja Vetters

OECD – WENGEN 2006 WORKSHOP

WENGEN, OCTOBER 4-6, 2006

JOANNEUM RESEARCH – Graz
Institute of Technology and Regional Policy (InTeReg)

Focus on Adaptive Capacity & Resilience

ECONOMIC VULNERABILITY (Nat. Hazards: 3 sectors & all)

EXPOSURE	SENSITIVITY	ADAPTIVE CAPACITY
•Increase due to climate changes but also increase by different land use patterns •Methods to determine exposure get better	•Strong increase due to higher values invested in households & firms	+:Global economic integration (Risk pooling) •Availability of Risk transfer mechanisms -?:Catastrophic Risk +:Weather Risk • …

JOANNEUM RESEARCH

Why are risk transfer mechanisms important for resilience?

→ **In General: Wealth is being created by exchange of goods and services to mutual advantage.**

- If markets are incomplete (e.g. risky goods cannot be traded) someone looses out
- Answer: Risk Markets create Welfare

→ **To recover quickly after losses from extreme events**

- Role of insurers
- What is the role of the State /Regulation?

→ **To deal with weather variability (smoothen revenues from weather sensitive businesses as increased uncertainty might frustrate investment)**

- Role of so called weather derivates

JOANNEUM RESEARCH

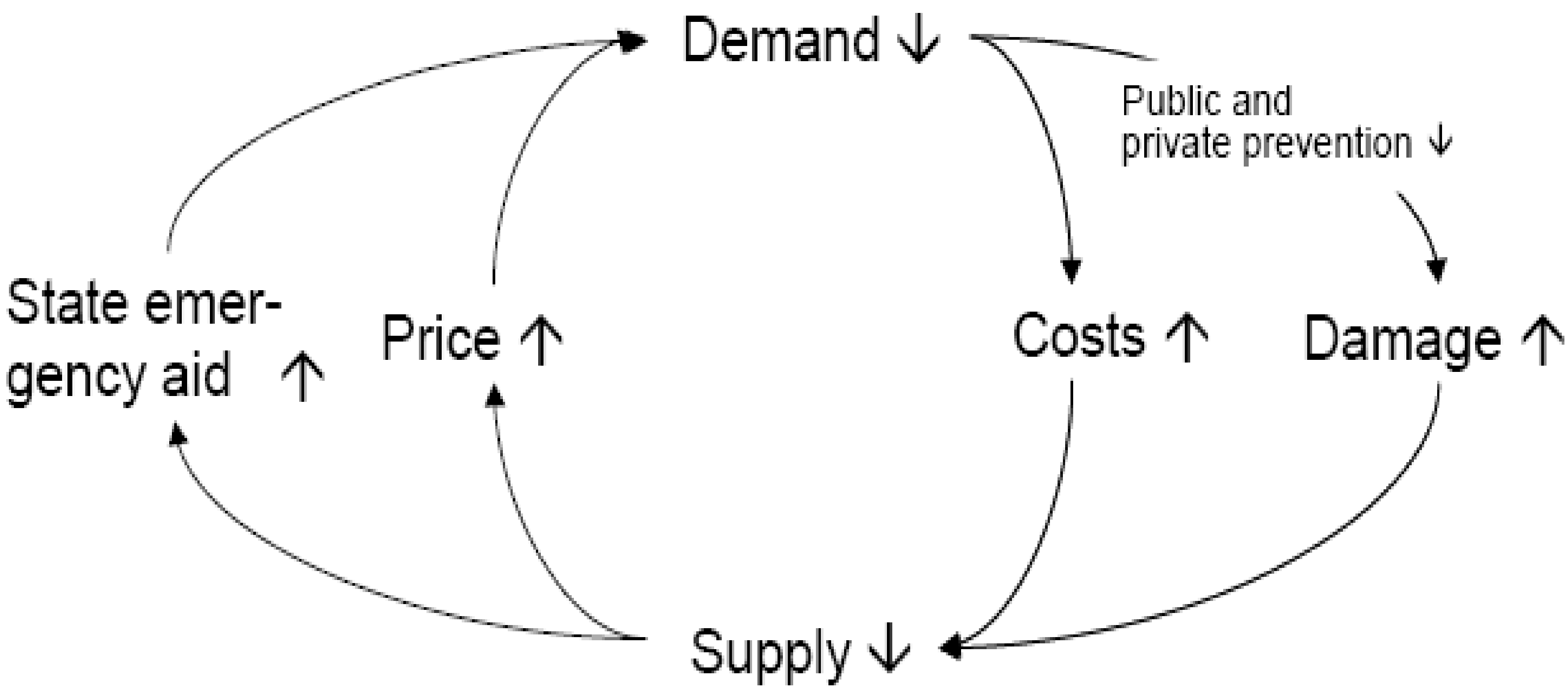
What are the key problems? The insurant

→ **risk aversion, fair insurance premiums → optimal to take out full insurance**

→ **people often underinsured or not insured at all**

- underestimation of the risk (low probability high impact events)
- government aid („charity hazard")
- little availability of insurance

Disaster Syndrome (Kunreuther, 2000)



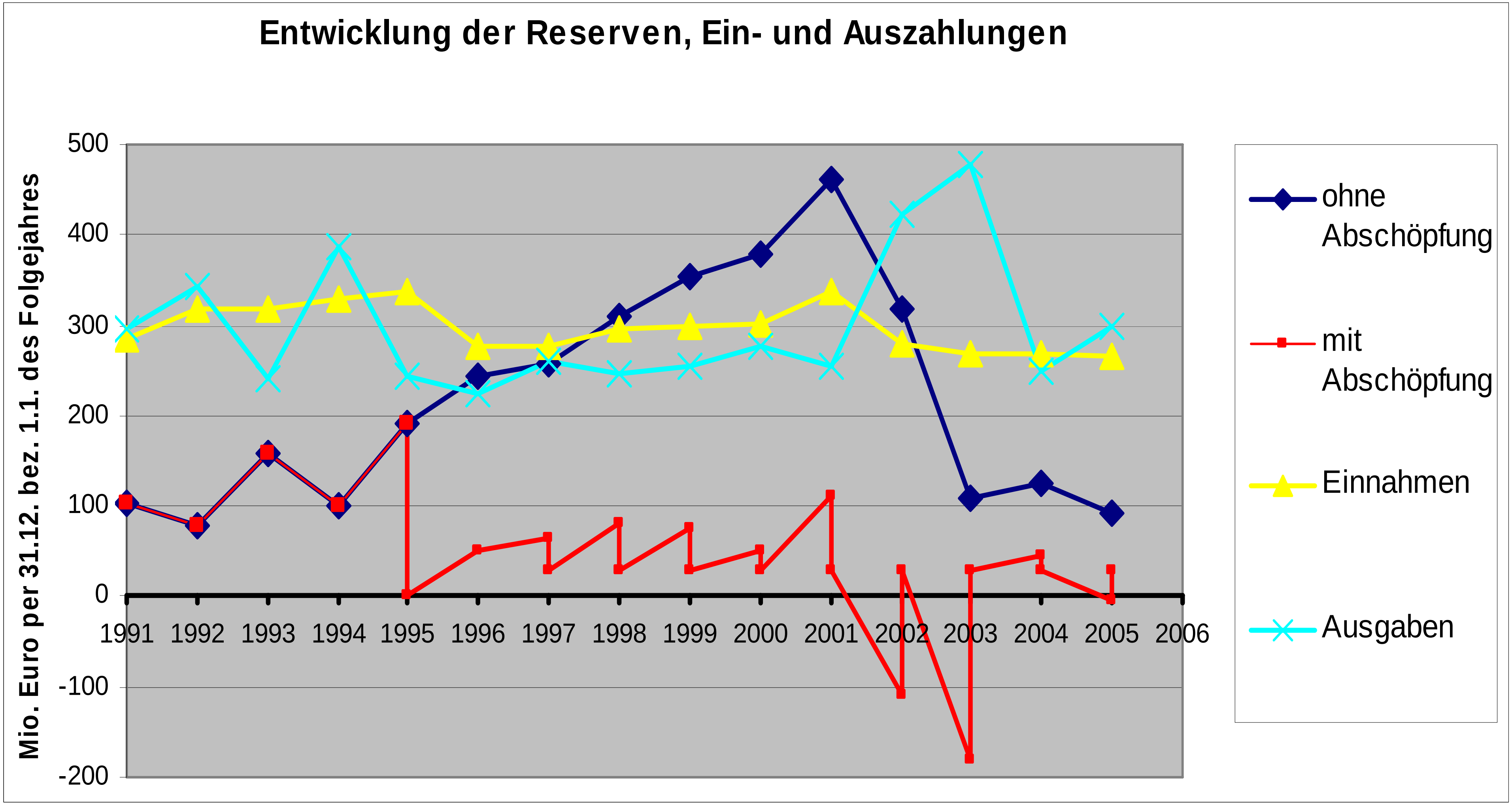
What are the key problems? The insurer

- **adverse selection**
  - small risk pools
  - economies of scale
  - increasing premiums
- **catastrophic losses**
  - risks are correlated
  - large amounts of capital needed
  - role of the capital markets (Jaffee/Russel 2006)
- **moral hazard**

What are the key problems? The State

- **disadvantages of ad hoc ex post compensation**
  - financed from the current budget ->political instability
  - damages often overestimated
  - cannot influence behaviour (moral hazard)
  - weakening insurance demand (charity hazard)
- **disadvantages of compensation funds**
  - difficult to store necessary (large) reserves at times of budget scarcity
- **disadvantages of public reinsurance**
  - moral hazard

Compensation Fund: Development of Reserves



Cross country comparison of RTM‘s

	Germany	France	CH (CPI)	CH (Priv.)	Spain	Turkey	USA
Insurance Carrier	private insurance companies	private insurance companies	Cantonal Property Insurance	Private insurance companies	public corporation	public corporation	National Flood Insurance Programme
Monopoly	No	No	Yes	No	Yes	Yes	No
Mandatory insurance	No	mandatory extension of coverage	automatic extension of coverage	mandatory extension of coverage	compulsory insurance (subsidiary)	compulsory insurance	No
Obligation to contract	No	(Yes)	Yes	(Yes)	Yes	Yes	Yes
Bundle of natural hazards	Yes	Yes	Yes	Yes	Yes	No	No
Role of the state	ad hoc relief	unlimited state guarantee for CCR	Keep monoploies	-	unlimited state guarantee	-	state guarantee (loan of up to 1,5 billion US$)

Cross country comparison

	Germany	France	CH (CPI)	CH (Priv.)	Spain	Turkey	USA
Premium design	risk-related	uniform	uniform plus risk loading	uniform	uniform plus risk loading	risk-related	risk-related, part. subsidised
Coverage against catastrophic losses	reinsurance	reinsurance (optionally with CCR), state guarantee	reinsurance plus insurance pool (IRV, IRG)	insurance pool plus reinsurance	reserve fund, unlimited state guarantee	insurance pool, intern. capital markets	state guarantee (loan of up to 1,5 billion US$)
Further issues	low insurance penetration	CCR confron-ted with adverse selection	CPI actively involved in prevention		compatibility with EU legislation		adverse selection is a big problem

RTM in Austria

→ **private insurance market + public compensation fund**

→ **private insurance market:**

- low insurance density
- very limited coverage
- extended coverage only outside flood risk areas

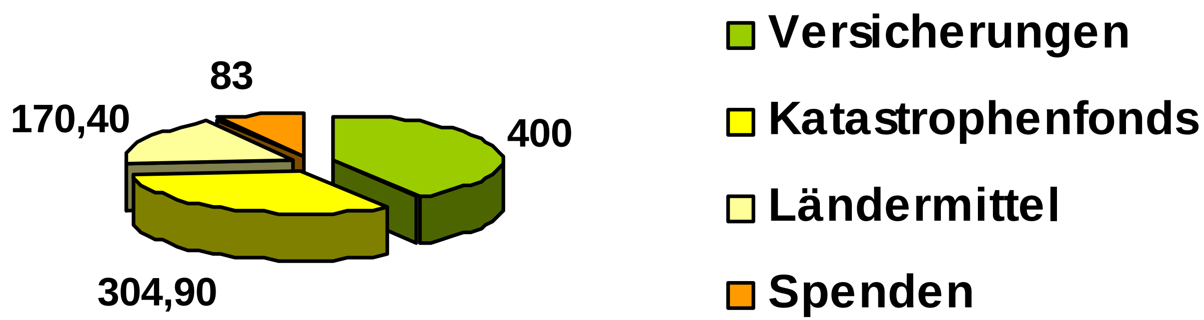
→ **catastrophe fund:**

- tax financed
- compensation and prevention
- compensation is limited

RTM in Austria

→ 2002 floods:

- Fund & Länder biggest insurer (in Mio. €):

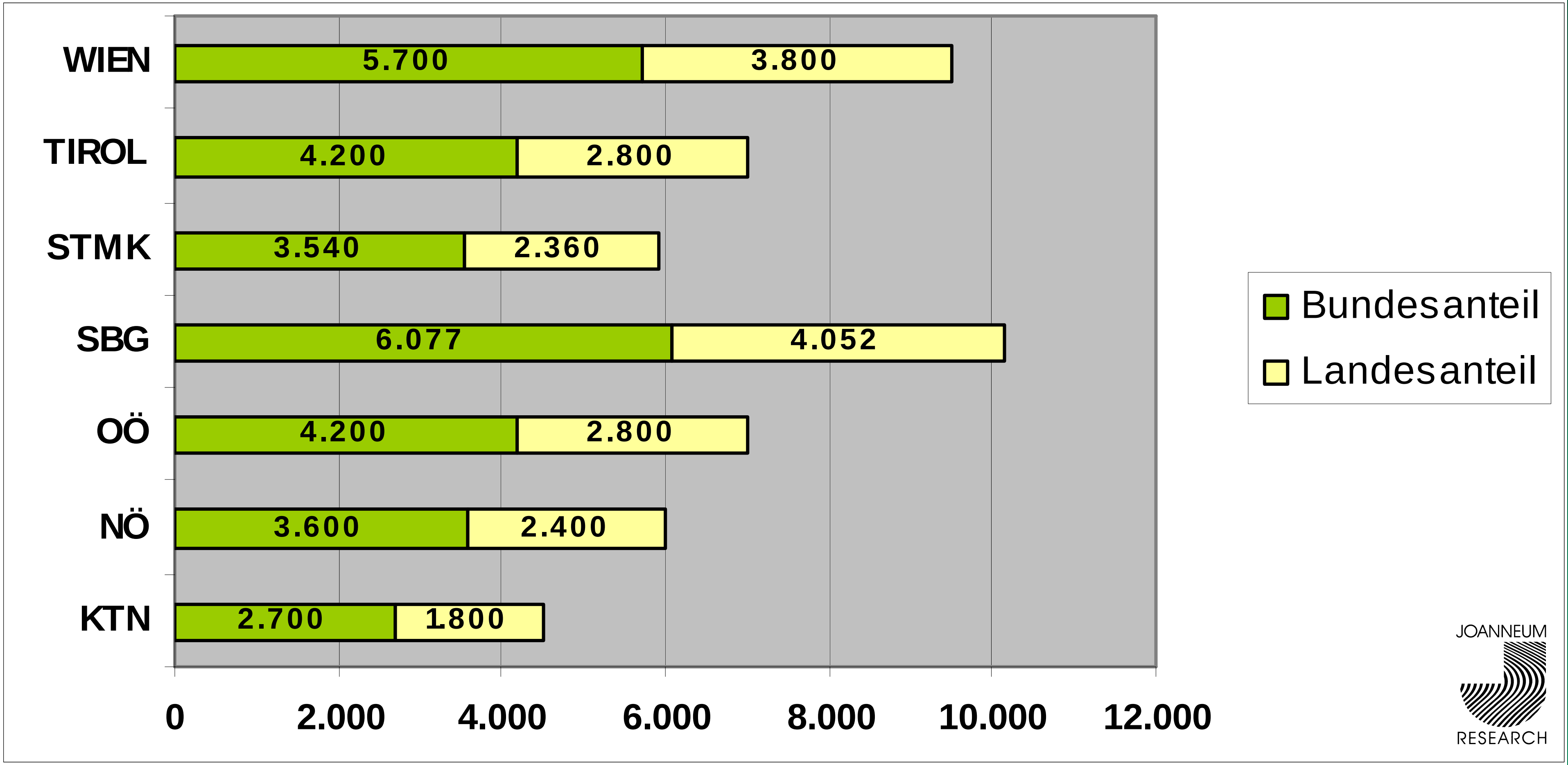


- compensation fund reserves not sufficient
- Failing market gets further disturbed from State intervention by deductions for the insured

RTM in Austria

- Concrete Example
- Family Home 250.000 € (constr. 1994, income 35.000 € before taxes, 140.000 € debts, 2 children)
- Damages to the building 15.000 € and 4.000 € to belongings, (of which 3000 resp. 1000 covered by insurance)
- Compensation by local government (Land), 60% refund by Compensation Fund
- So in fact 9 different RTM‘s in Austria

Regulation of the same case



JOANNEUM RESEARCH

RTM in Austria: concrete example

- **Financed by taxes**
- **80% by Households, 20% by enterprises**
  - „Premium“:12 € per HH, 50 Enterprise
- **Leading to 23% - 53 % coverage**
- **Comparison:**
  - Spain: 22,5 € full coverage
  - Switzerland: 105 € - 272 € full natural hazard package

Lessons for regulating the market in Austria

- Radical option: State could stay out completely allow for pooling
- private public partnership
- compulsory extension of coverage to include bundle of natural hazards
- risk-related premiums and deductibles
- proportional reinsurance offered by the compensation fund
- stop-loss reinsurance offered by the compensation fund + government as reinsurer of last resort

Reform Option – advantages (1)

- **compulsory extension of coverage**
  - large risk pool
  - solves problem of adverse selection
  - affordable premiums
  - risk areas can be included
- **bundle of natural hazards**
  - everybody is potentially affected
  - increased acceptance
  - cross-subsidizing is minimised
- **risk-related premiums and deductibles**
  - signals and incentives for preventive measures
  - moral hazard is controlled

JOANNEUM RESEARCH

Reform Option – advantages (2)

- **proportional reinsurance offered by the compensation fund**
  - insurance companies´ experience and expert knowledge
  - moral hazard is avoided
- **stop-loss reinsurance +**
- **government as reinsurer of last resort**
  - risks are bearable and insurable
  - diversified effectively over time

Weather Derivatives: Drought

- Many weather sensitive risks not insurable

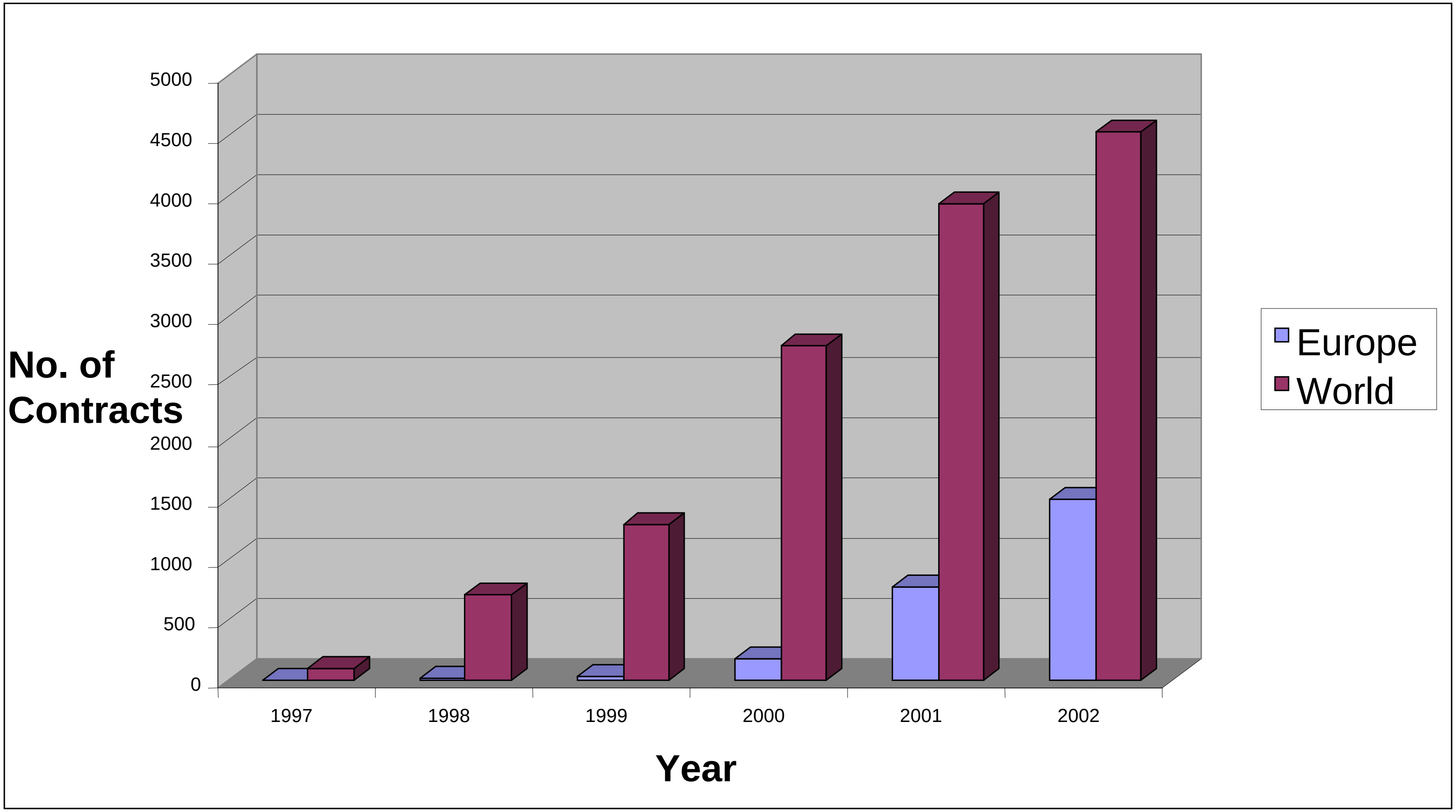
- Agriculture, Energy and Tourism Sector sensitive to lack of rainfall

- Weather Derivative: derivative financial instrument for which meteorological data serve as basis variables (underlyings). Those Variables (or indexes) are objectively measured by a third party.

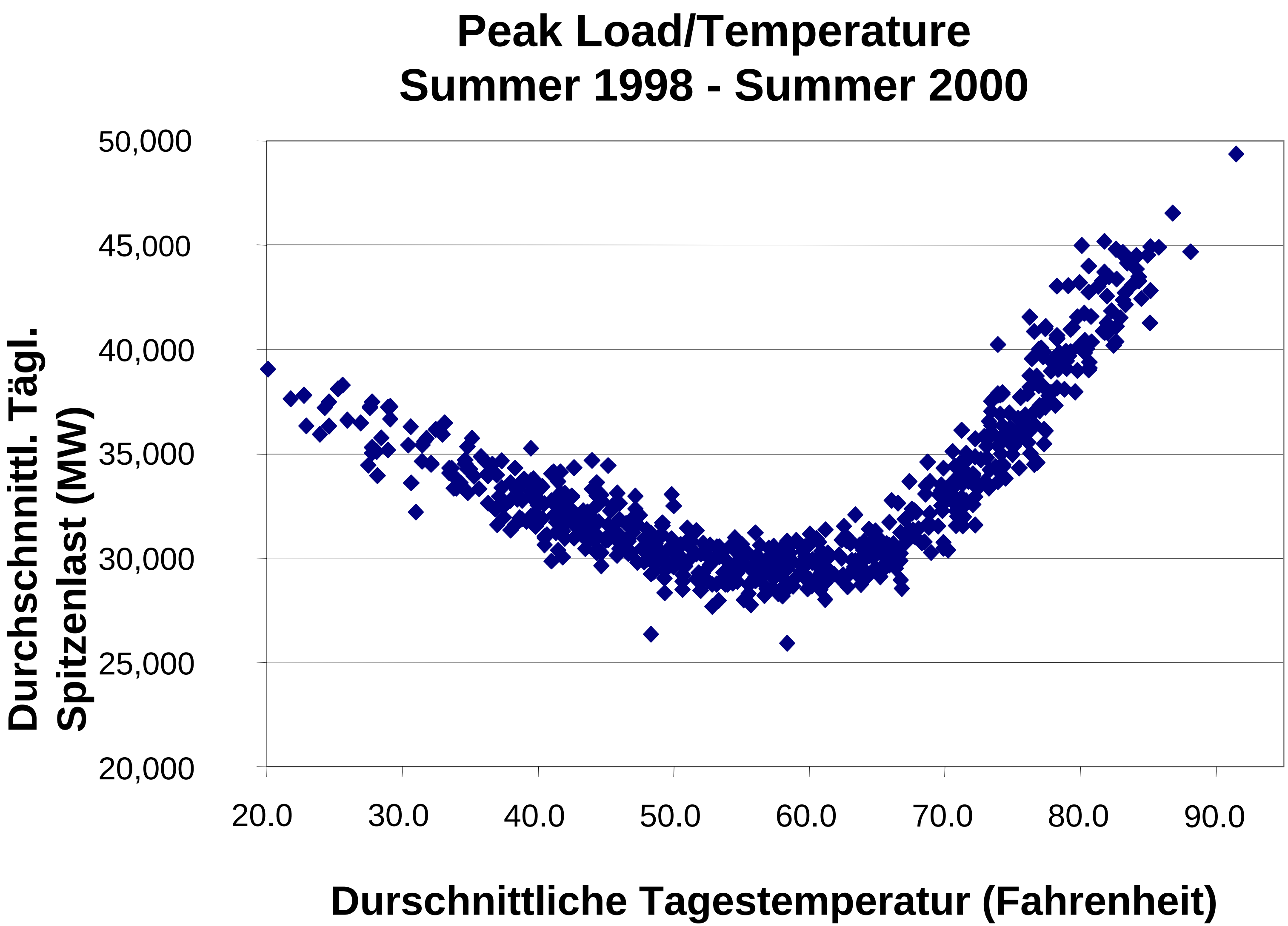
- Advantage to insurances: No moral Hazard, no individual loss claims & verification. Risk transfer to the capital market, coverage of so far not insurable risks.

- Looking for inverse risks (hydropower & tourism)

The Market


No. of Contracts
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1997
1998
1999
2000
2001
2002
Year
Europe
World

Searching for correlations



a TRADITION of INNOVATION

01.12.2006

ISO 9001 certified

Case Study Grassland

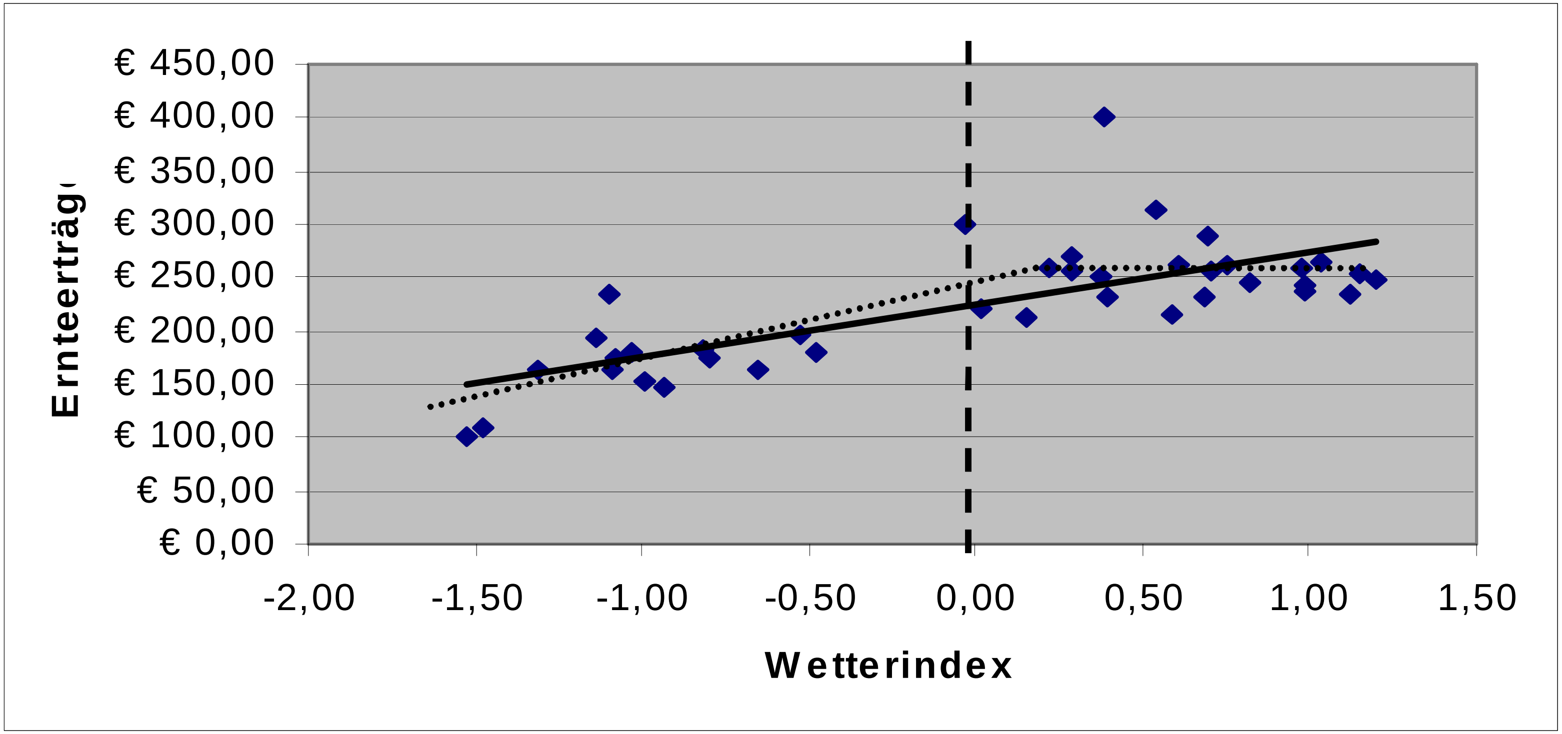
- Positive correlation between harvested quantity and monthly precipitation especially in June and July
- Negative correlation between harvested quantity and temperature especially in the warmest months from Mai to August

- Weather Index: by using the mean and standard deviation we constructed the following index:

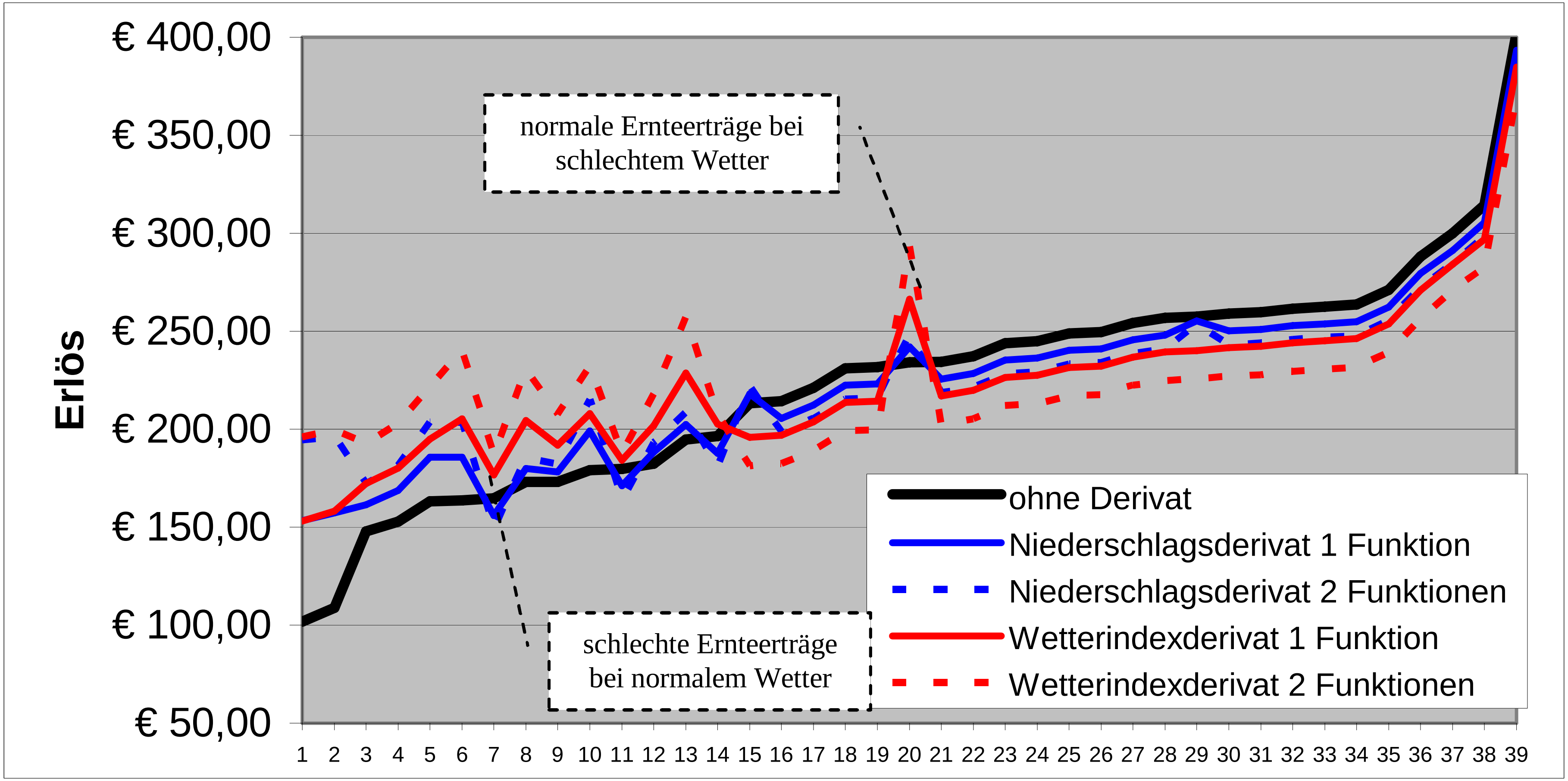
$$\text{Index}(P,T) = 0{,}5(P - \eta P)/\sigma P + 0{,}5(\eta T - T)/\sigma T$$

Case Study Grassland

→ Harvest revenues vs. Index



Case Study Grassland



Conclusions

- Austrian Hail Insurance (Pool of private insurers) will use these results to come up with a new product 2007
- Allread now it is pathbreaking in drought insurance (economically viable?)
- Strength of weather derivatives is to reduce the range of possible profits, full elimination of risk is not possible
- Role of the State in weather derivatives limited: but European lacking behind might involve active measures to be overcome (availability of weather data for free)
- Role of the State in natural hazard insurance: give up intervention or do a thorough re-design of the mechanism allowing fruitful co-operation of the private sector and the state

Thank you for your attention!