UNIVERSITY OF HOHENHEIM
Institute for Agricultural Policy and Agricultural Markets

Agricultural and Food Policy

(4201-410)

Income Fluctuations, Farm Risk Management and Government Involvement

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Lecture notes and further information:
http://www.uni-hohenheim.de/apo

Lecture Outline

1. Introduction
2. Major causes for agricultural income fluctuations
3. Risk and crisis management
4. Economic rationale for government intervention
5. Concept and impacts of a government-run scheme: the example of CCP
6. Guidelines to reduce economic distortions of government-run schemes
7. Alternatives to government-run schemes
8. Conclusions

Background

- Policy objective of most countries:
  Securing and supporting the income of farmers
- Shift in type of agricultural policy instruments
- Two major driving forces behind shift:
  1) WTO requirements
  2) Increased climatic variability and a higher frequency of extreme weather events and natural disasters ⇨ fluctuations in farm incomes↑

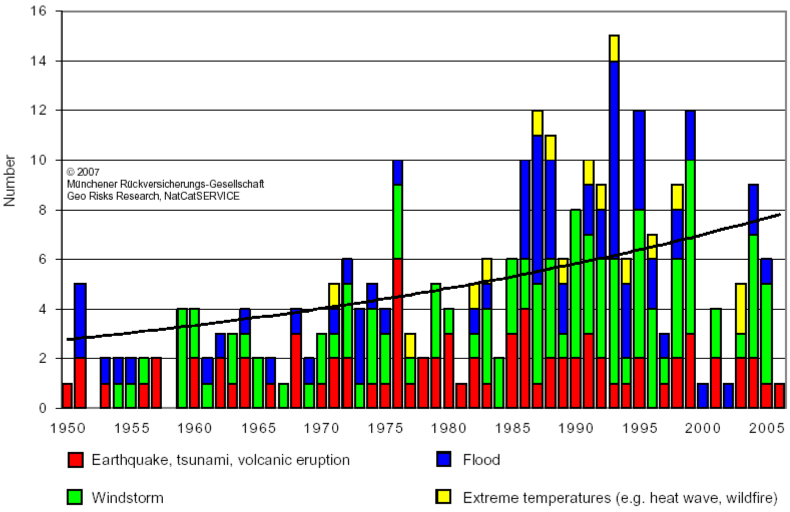
⇨ Increased use of insurance and emergency assistance provisions

⇨ Heightened policy focus raises questions!

Major causes for agricultural income fluctuations

- Agricultural income is subject to fluctuations, caused by different effects
- Most common: *seasonal* income fluctuations (determined by seasonal variation of production)
  - = integral part and *predictable*
  - ⇨ hence taken into account in farmers fiscal planning
- But, also *unpredictable* risks and crises
  - ⇨ can lead to financial distress with the affected farmers

Great natural disasters 1950 - 2006 (Number of events)



Source: Munich Re (2007): NatCatSERVICE

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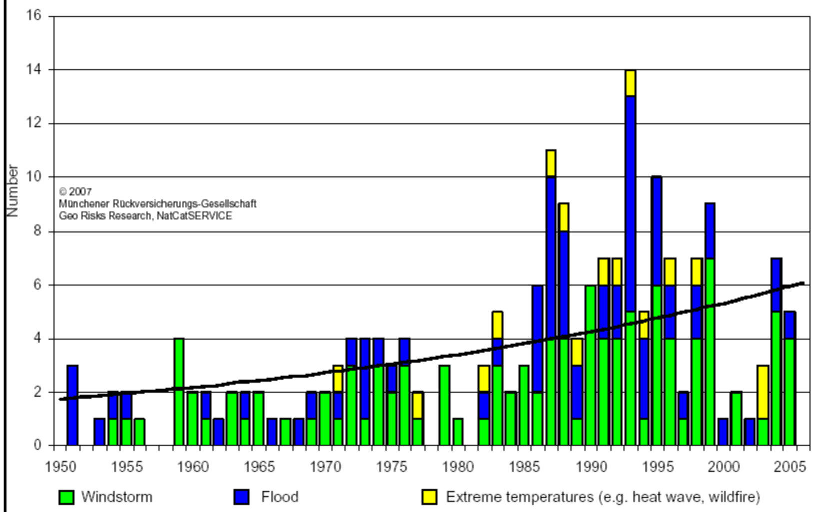
Great weather disasters 1950 - 2006 (Number of events)



Source: Munich Re (2007): NatCatSERVICE

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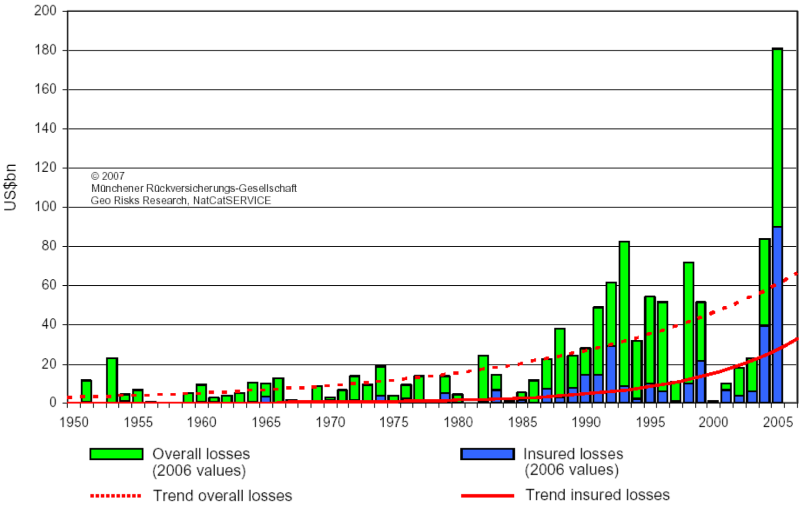
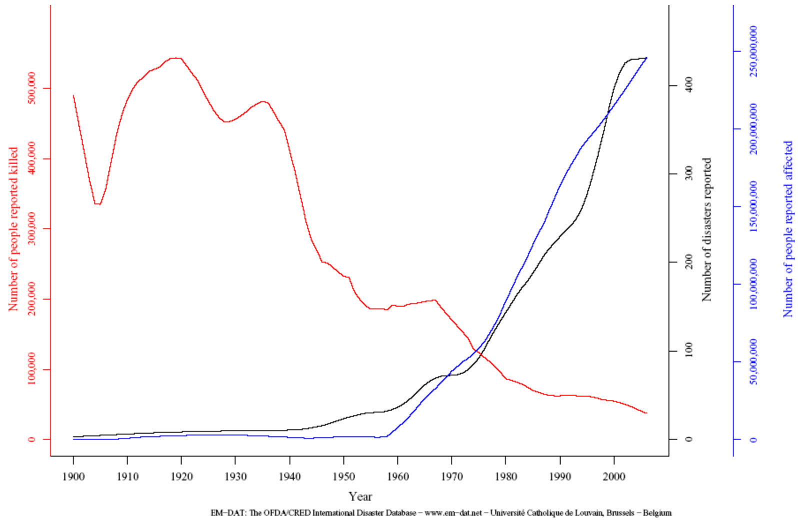
Great weather disasters 1950 - 2006
(Overall and insured losses)



Source: Munich Re (2007): NatCatSERVICE

Natural disaster summary 1900−2006
(linear−interpolated smoothed lines)



Source: EM-DAT (www.em-dat.net)

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Classification of most important risks in agriculture

- **Production risks:** refer to agricultural output or yields (e.g. related to adverse weather conditions)
- **Price risks:** refer to the risk of falling output prices and/or rising input prices after a production decision has been taken
- **Human or personal risks:** refer to the death, illness or injury of the farm operator and/or its labour force and may result in interruption of business
- **Financial risks:** refer to capital as a production factor; rising capital interest rates or insufficient liquidity may jeopardise the financial stability of any enterprise
- **Liability risks:** refer to any private or business activity (e.g. changed by use of new technologies)
- **Institutional risks:** refer to changes in the institutional environment (e.g. agricultural policy)

Most important causes for a crisis in agriculture

- **Natural disasters**, like e.g. drought, floods, excessive rain, hail, storms, frost, earthquakes, etc.
- **Diseases and pests**, affecting the health of animals or plants (e.g. BSE, MKS, avian influenza)
- **Contaminations in the food chain** (e.g. trough dioxins)
- **Unforeseeable disruption of market access**, e.g. caused by an unexpected closure of important export markets

⇨ Risks and crisis can have a high impact on agricultural income

⇨ **Risk and crisis management is indispensable**

Risk and crisis management in agriculture

- In a market economy risk and crisis management is primarily seen as the duty of each individual

⇨ Two approaches for farmers to influence the risk that is associated with their operations:

1. On-farm risk management strategies

- **risk prevention and reduction**
  (e.g. grow products with low risk exposure)
- **diversification of farming activities**
  (i.e. portfolio of activities that have outcomes with low or negative correlations)
- **building financial reserves**
  (i.e. create a risk bearing potential that allows compensation)

Risk and crisis management in agriculture

… Two approaches for farmers to influence the risk that is associated with their operations (contd.):

2. Marked based (risk sharing) instruments

- **insurance contracts** (if risk pooling is possible)
  (e.g. insurance against hail)
- **production and marketing contracts**
  (e.g. forward contracting of inputs and outputs, hedging with futures and options, weather derivates)

⇨ Risk sharing instruments presuppose the existence of market partners

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☞ farmers have a wide range of possibilities to influence or cope with the risk associated with their operations

But…

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Economic rationale for government intervention

- **Market failures**

  ➪ might lead to problems in the development and implementation of marked based instruments.

- Main causes for market failures:
  information asymmetries and systemic risk

- **Information asymmetries:**

  ➪ lead to limitations in the calculation of the loss probability by the insurance companies, which might end up in either

  - **adverse selection**
    (if only farmers with high risks take insurances) or
  - **moral hazard**
    (if the insured reduce their efforts to prevent losses, once they purchased an insurance)

Economic rationale for government intervention

… **Market failures** (contd.)

- **Systemic risk:**
  - if many farmers are affected by a risk or crisis at the same point of time or
  - if there is a high correlation between the risks

  ➪ might lead to prohibitive high costs for insurance companies

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- If there are market failures in risk markets an unstable farm income can lead to liquidity problems

  ➥ liquidity problems can lead to inefficient allocation of resources and general sectoral misallocations

  ➥ might be linked to high economic costs for society

☞ **government intervention can be justified**

Concept and impacts of government-run schemes

- Wide range of policy approaches to intervene
- Most applied:
  government-run insurance and safety-net schemes
- **Government-run schemes:**
  farmers receive a direct income payment, paid by the government in the event of severe income or asset losses
- **Example: Counter-Cyclical Payments (CCP)**

Counter-Cyclical Payments

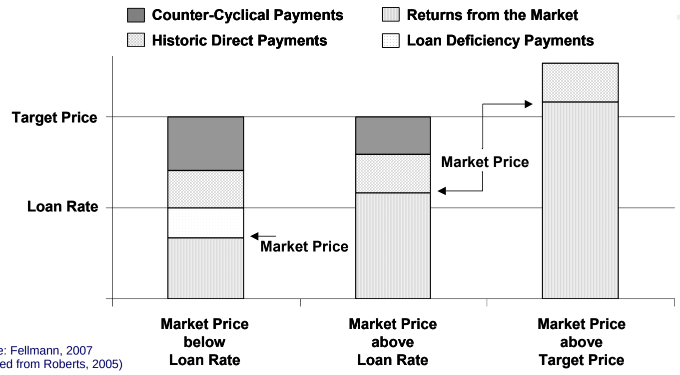
= direct income payments paid to farmers by the government whenever their farm income falls below an individual threshold

- threshold is calculated for each individual farmer according to fixed historical references and
- payment amount varies inversely with market prices

The Concept of US Counter-Cyclical Payments

Main types of program payments

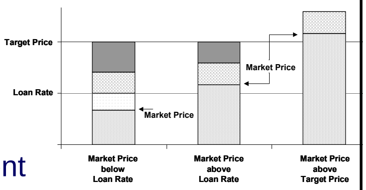
- **Loan deficiency payments or marketing loans:**
  compensation of price difference between farm gate prices and minimum established support prices
- **Historic direct income payments:**
  constant compensation payments, paid for losses due to agricultural policy reforms and made on historical yield and area bases
- **CCP**



Source: Fellmann, 2007 (adapted from Roberts, 2005)

General impacts of government-run schemes

- Important question for any policy measure: Are there economic distorting effects?
- In the case of CCP, payments are production related (production is a prerequisite in order to qualify for CCP)



- CCP are also price related, as the payment amount relies on current market prices

⇨ CCP tend to result in similar economic distortional effects as guaranteed market prices

- Considerations hold even as CCP in the USA are paid according to fixed historical references
- **Magnitude of the economic distorting effect is an empirical issue, but…**

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General impacts of government-run schemes

General complications with government financed income stabilisation schemes:

- **fluctuations in income and production variables are generally linked**
  - ⇨ not possible to design government payments that are entirely unrelated to production
- **underwrite farm risk**, i.e. have risk-reduction effects

⇨ **the greater the degree of income stability**, the **less incentives** have farmers to adopt market-related investment, production and risk management strategies

- ⇨ this, in turn, stimulates the need for government involvement if farmers face income losses

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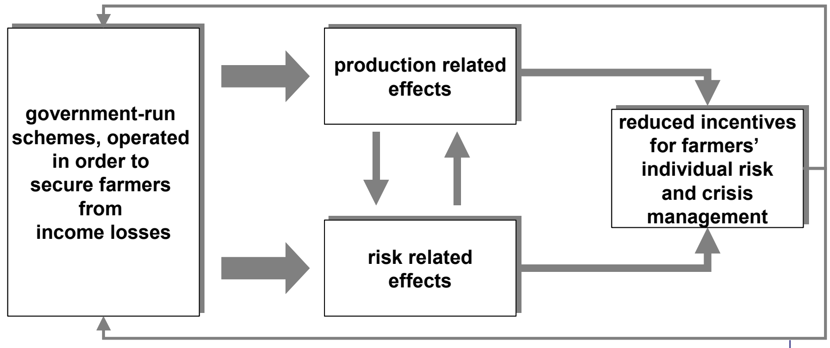
General impacts of government-run schemes



Source: Fellmann (2007)

➪ **inherent trade-off:**

the more effective a scheme is in preventing farmers against income losses, the greater is the economic distorting effect caused by the scheme, and vice versa

Guidelines to reduce economic distortions of government-run schemes

1. **Narrow down the situations** in which farmers might receive such government payments
   - ➪ rule out events and situations which are considered as reasonable foreseeable
   - ➪ clear definitions; specific parameters
2. **Use a relatively low income level** that triggers the measure
3. **Payment amount** does **not** necessarily have to **equal the total income loss**
4. **Focus** on income of the **whole farm enterprise**, rather than income from particular outputs
   - ➪ equity: income of the entire farm household should be considered

Alternatives to government-run schemes

- Following the guidelines: economic distorting effects can be reduced, but still remain to some extend (and can be substantial)
- Government-run schemes ***only bridge market failures*** but **do not remove or address the underlying causes**

  ⇨ however the **most efficient** way to address market failure is to **correct the cause**

  ⇨ directly address the problems of information asymmetries and systemic risk

  ⇩

  facilitate the establishment of missing private markets for risk coverage

Alternatives to government-run schemes

1. Providing an appropriate institutional and legal framework

- **primary role of government involvement** in risk management:

  provide a sound business environment with competitive markets and an appropriate legal framework

- in order to reduce moral hazard this includes, e.g. allow private insurances to
  - request extensive information from the insured farmers,
  - exchange information with other insurance companies and
  - inquire in the event of damage or loss

Alternatives to government-run schemes

1. Providing an appropriate institutional and legal framework (contd.)

- In order to control adverse selection (as well as moral hazard) significant investments in acquiring information and monitoring are necessary
- If costs are too high for such investments, the use of public funds to obtain better information technologies can be efficient, e.g.
  - subsidise research and development for better technologies
  - provide or subsidise the composition of yield and income databases at a detailed level (farm)

Alternatives to government-run schemes

2. Providing information and training to farmers on the use of market-based instruments

- *Human cognitive failure* can lead to difficulties in establishing contingency markets
  - people tend to underestimate or even ignore the risk they face
  - furthermore people are generally optimistic and think that their own risk is lower than risk for other people
- In addition most farmers are still *unaware or lack understanding* of modern market based risk management instruments

⇨ **Comprehensive information and training programmes can be expected to help**

Alternatives to government-run schemes

3. Reducing overall policy support within the farm sector

- In in most developed countries farmers operate in a highly protected and subsidised environment
  - this environment provides a high degree of income stabilisation for the farmers

  ⇨ **reduced incentives for the development of private risk markets in agriculture**

  - holds also for specific ad-hoc aids or ex-post assistance

Alternatives to government-run schemes

4. Financial assistance to the premiums of private insurance schemes

- Has the potential to ease and stimulate farmers' participation in such schemes
- **But:** in countries where in place, participation of farmers is rather low
- **Critics:**
  - can become very expensive
  - can lead to a high level of support to farmers (in addition to their stabilisation effects)
  - incentive to moral hazard and can generate rent seeking behaviour
  - equity problems

Alternatives to government-run schemes

5. Governmental reinsurance for private insurance schemes

- Reinsurance = Insurance for insurance companies
- Governments might have better credit standing and risk diversification possibilities
- But: high risk is uncorrelated to important international capital markets
  - ⇨ thus diversification is possible also for private insurance companies
- **But:** sometimes assumed to be necessary in order to assist the development of viable private insurance schemes
  - ⇨ only a *temporary tool* that has to be removed after a few starting years

Conclusions

- Agricultural income is subject to fluctuations, caused by different effects
- Approaches for farmers' risk management: on-farm risk management strategies and the use of marked based (risk sharing) instruments
- Government involvement can be justified because of market failures
- But: specific government-run insurance and safety-net schemes are flawed
- Crucial elements to keep economic distortions as low as possible: design and the period of time over which they might be suitable

Conclusions

- Design: trigger mechanism is crucial
- Period of time: only as temporary or transitional approaches
  - possibility to emphasize that:
    widen the gap between the baseline and threshold income each year
- Financial assistance to premiums of private insurances and governmental reinsurance:
  only as incentives to kick-start the development of private market-based schemes
- Major obstacle for private, non-policy solutions: highly protected and subsidised environment in which most farmers operate

Conclusions

- Most efficient way to use public assistance: directly address information asymmetries and systemic risk
- Primary role of government involvement:
  provide an appropriate institutional and legal framework
- Subsidies to the research and development of better information technologies can be efficient
- Governments could provide or subsidise the composition of income and yield databases at a detailed (farm) level
- Education and training is an obvious field for the public sector to help develop private risk sharing markets

Conclusions

- In summary, to decrease economic distortions it is necessary that farmers cover the risks involved in agriculture on their own
- Therefore the development of private risk sharing markets is indispensable in the longer term
- Consequently, the use of public assistance should only be seen as a temporary or transitional solution in the context of farm income fluctuations