

# Latvian Grain Sector Model: data problems and results

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**Danute Jasjko and Guna Salputra**

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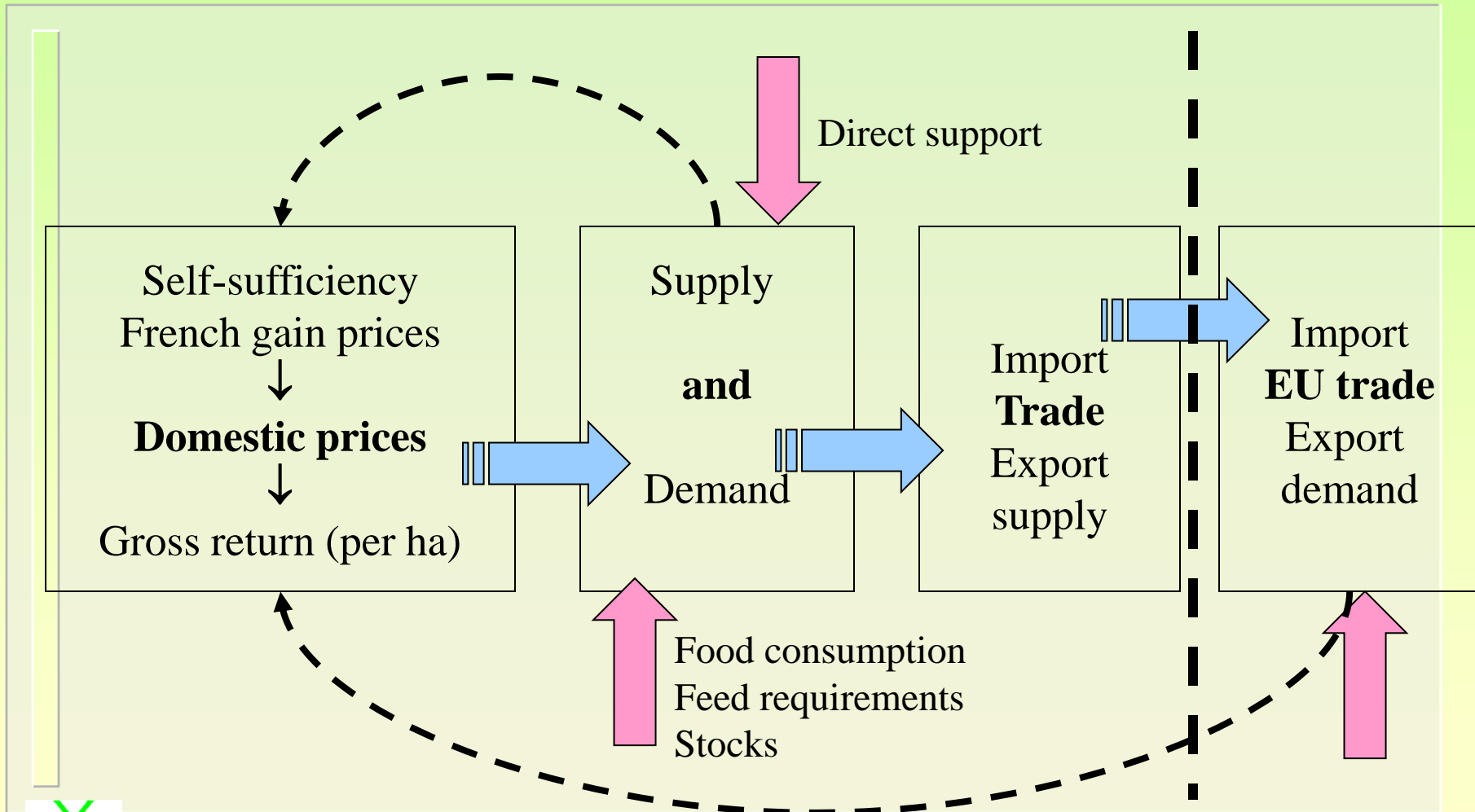


# Basis for Latvian Grain model

- ❑ **The EU GOLD MODEL (introductory manual);**
- ❑ **Finnish AG Model in EXCEL**
- ❑ **Swedish AG MODEL Example (data files, equation listing, documentation and estimation results)**



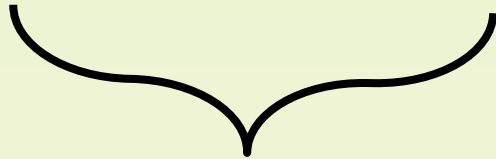
# Structure of Latvian Grain model



Equilibrium between export demand and export supply

# List of sectors/products analysed

- Wheat;**
- Barley**
- Rye**
- Oats**
- Rape (0,5% of GAO) ;**
- Cattle (6%);**
- Pig sector (11%);**
- Poultry sector (2%);**
- Milk (24%)**



15% of Latvian Gross  
agricultural output in  
2001

# Some specific features of Latvian Grain Sector and model

- ❑ **The intervention price level is higher than market price;**
- ❑ **The increase of areas harvested does not accompanied by decrease of yield level;**
- ❑ **The calculation of feed demand index is based on:**
  - **Amount of fodder units necessary for production meat and milk;**
  - **Share of each type of grain necessary for production of meat and milk on the base of feeding diets for animals.**



# Data sources

1. **MoA and RSS** ( Product balances)

Stocks(t-1) + production + import =

= domestic consumption + export+feeding +stocks(t)

2. **CSB** (Area harvested and yield levels)

3. **Custom declarations** (export and import volumes);

4. **FAPRI forecasts** (GDP deflator, population);

5. **Assumptions for all countries** (French prices) and assumptions used in Finnish model (exchange rates EUR/USD)



# Data problems: (1) Lack of data

- ❑ **Grain balances:**
  - **Balances are available for some years only;**
  - **Balances crated for calendar and crop years;**
  - **Usually balances created for aggregate items.**
- ❑ **Feeding data;**
- ❑ **Projections for exchange rate;**
- ❑ **Consumption data;**
- ❑ **Data about prices;**
- ❑ **Key prices for rye and oats.**



# Data available for Latvian grain sector

Set of data	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. Crop areas												
2. Yields												
3. Data from the grain balances (stocks, export, import, consumption, feeding)												
4. Import and export data												
5. Procurement prices												
6. Intervention stocks												
7. Animal diets												
8. Exchange rate												
9. Data about GDP and population												
10. State support												

necessary data for calendar year
  data for agregate "grain" item
 
 data for yield year



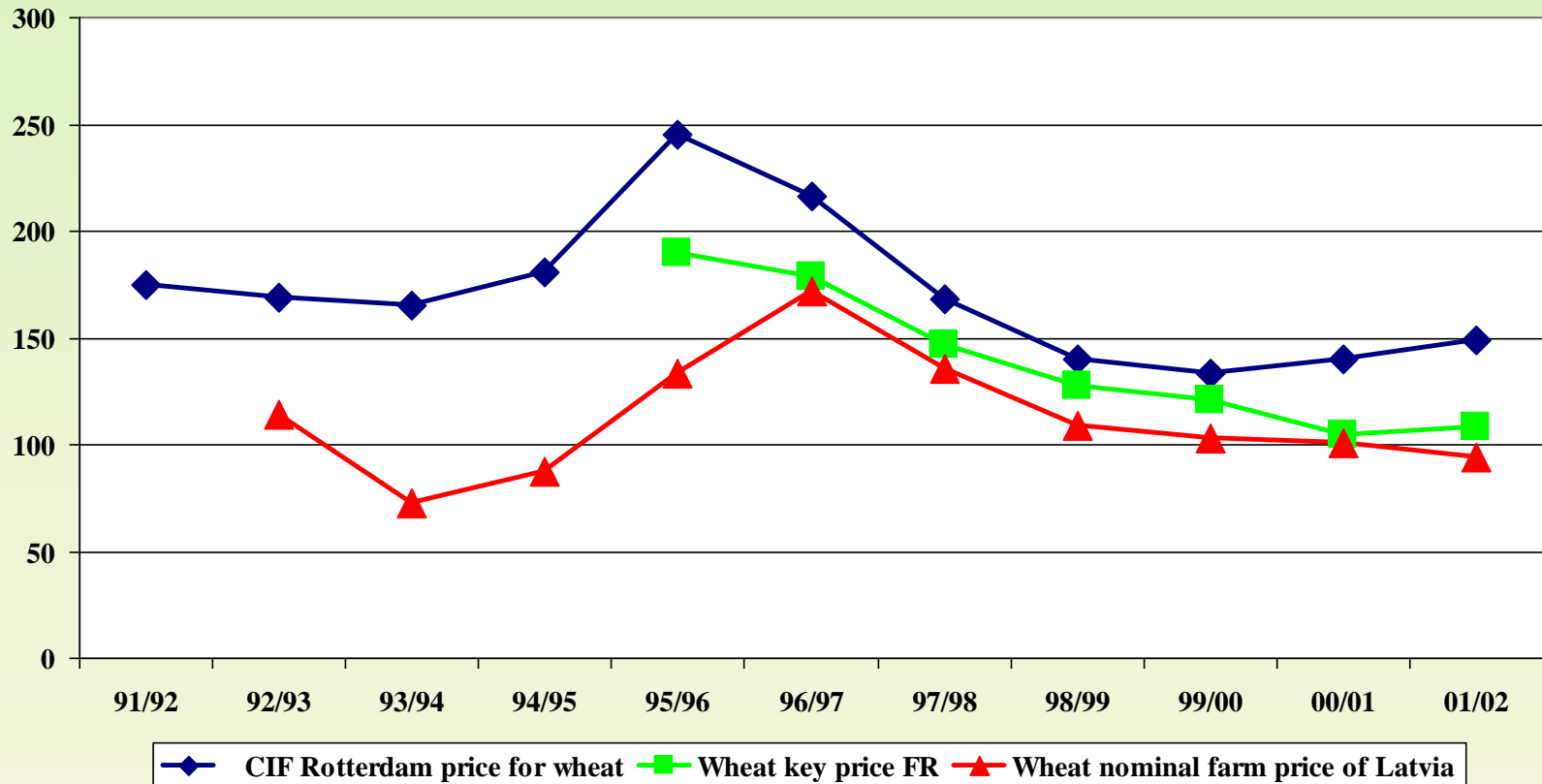


# Dynamic of Latvian procurement (FGP) prices for wheat from 1990 to 2001

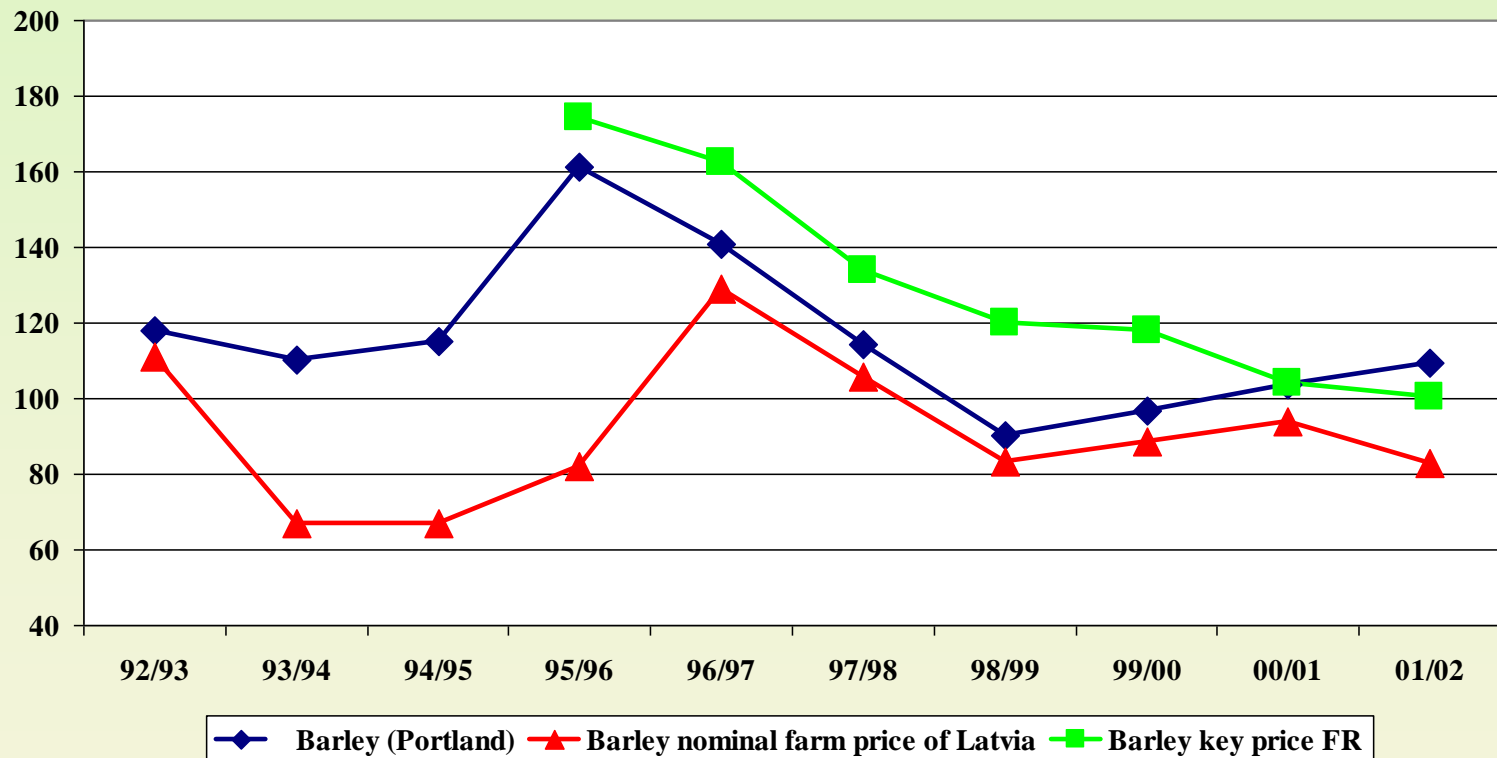
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Procurement prices for wheat, LVL	0,12	0,50	9,53	4,89	4,90	7,03	9,47	7,86	6,43	6,03	6,12	5,91
Exchange rate, LVL per 1 EUR	X	X	1,027	0,793	0,662	0,682	0,69	0,657	0,662	0,625	0,56	0,563
Procurement prices for wheat, EUR	X	X	9,28	6,17	7,40	10,31	13,73	11,96	9,72	9,65	10,93	10,50
Fitted values of wheat price, EUR	13,62	13,90	13,76	13,03	11,60	12,16	12,08	11,56	10,30	10,18	10,20	10,31
GDP deltator	0,01	0,03	0,27	0,44	0,60	0,69	0,81	0,87	0,91	0,96	1,00	1,02
Real wheat price, EUR	1378,08	535,56	51,35	29,51	19,27	17,55	15,00	13,36	11,35	10,65	10,20	10,15



# Correlation between Latvian and French wheat prices, USD /1000kg



# Correlation between Latvian and French barley prices, USD /1000kg



# Data for oilseed sector

Data type	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. Production, thsd.t						0,9						13,00
2. Eksports, thsd.t.						0,57						12,10
3. Import, thsd.t.						0,01						1,11
4. Seed use, thsd.t.						0,01						0,03
5. Stocks, thsd.t.	0	0	0	0	0	0	0	0	0	0	0	0
6. Processing (crushing), thsd.t.						0,33						1,98
7. Domestic use, thsd.t.						0,34						2,01
		necessary data for calendar year										

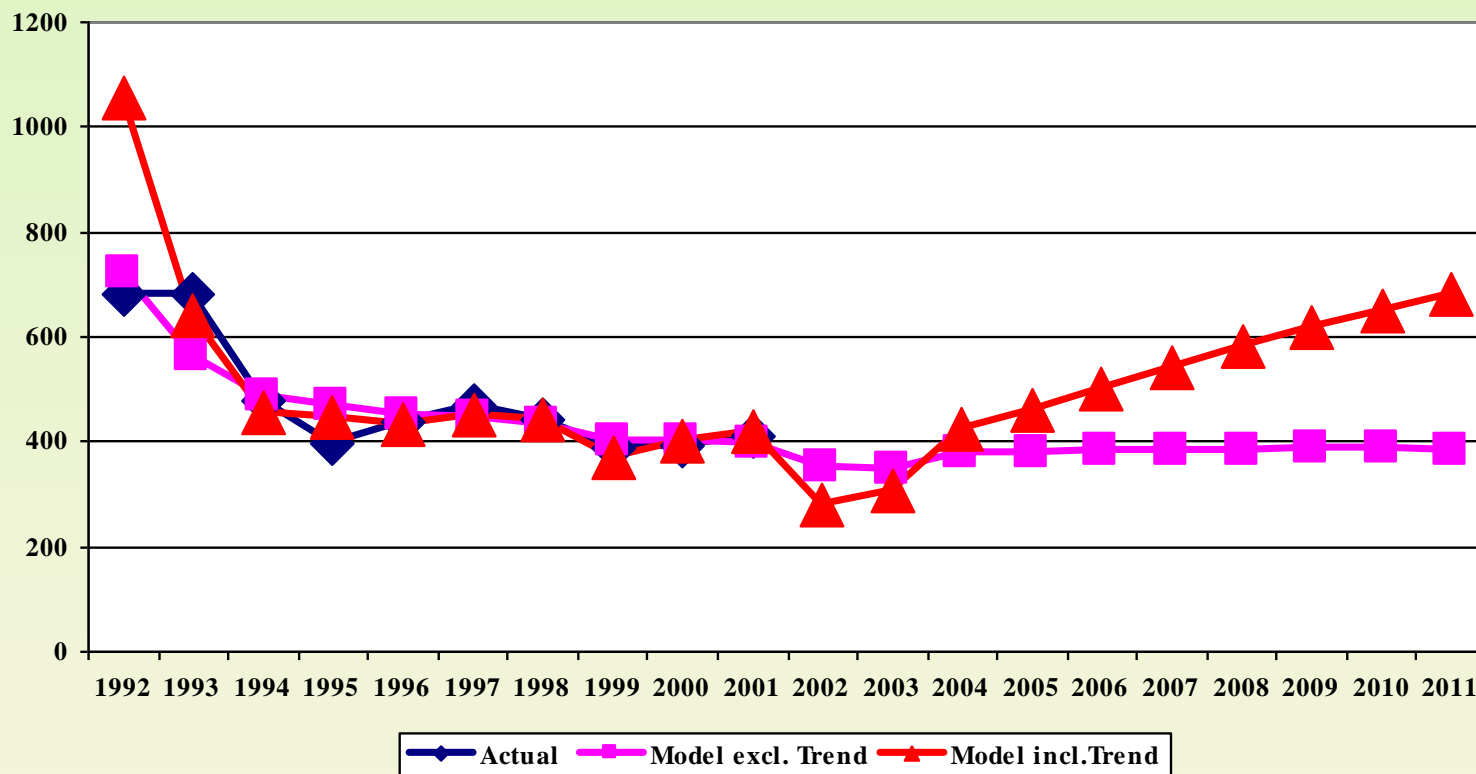


## Data problems: (2) short time series

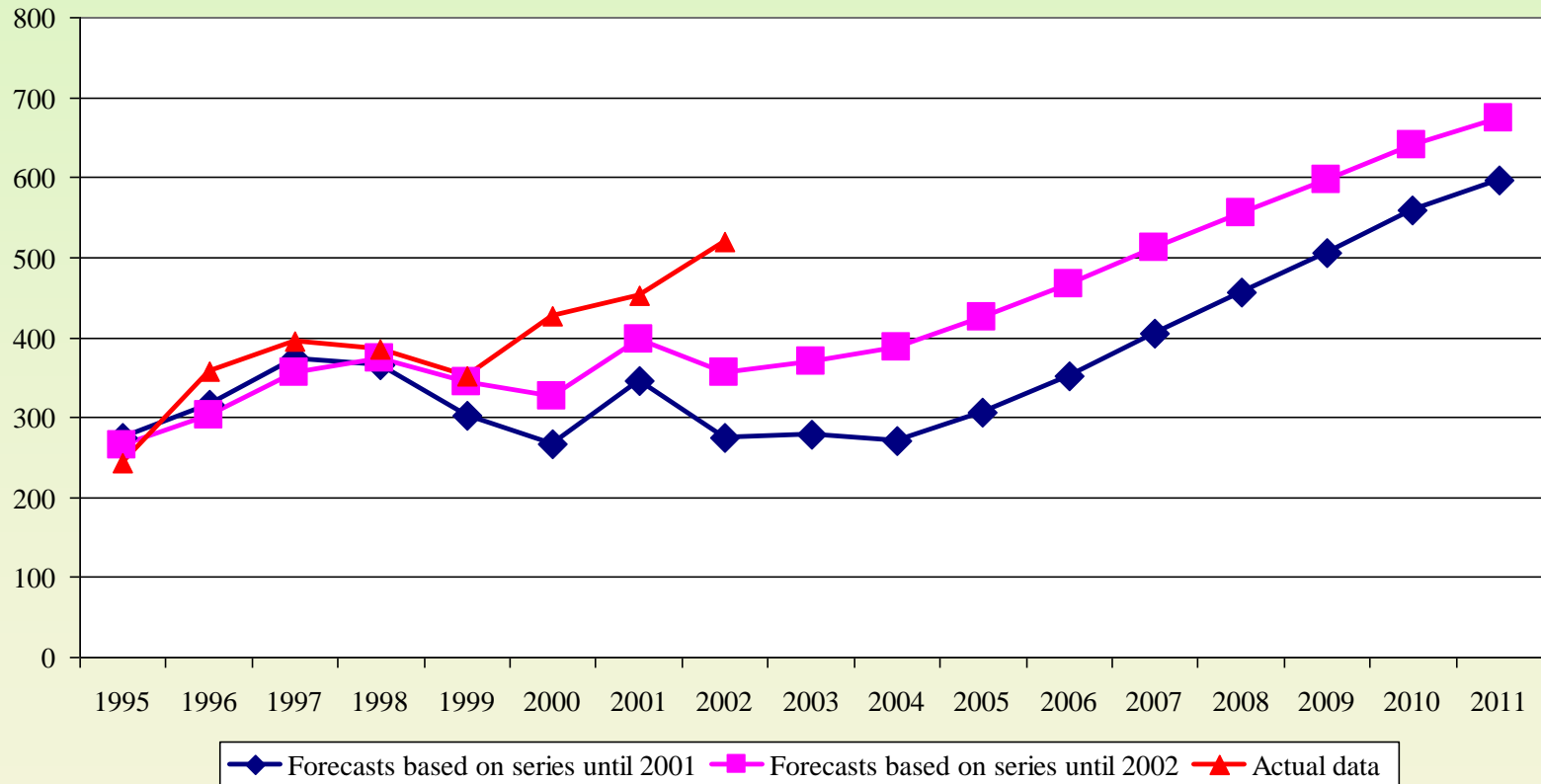
- ❑ It is not acceptable from theoretical point of view:
  - *Sometimes there are only 4 or 7 observations in the series;*
- ❑ Too short time series do not allow to make long-term forecasts:
  - *Number of observations = number of years forecasted;*
- ❑ Sometimes Trend is not usable as a factor;
- ❑ Prognoses calculated are not stable.



# Projections for 4-grain area harvested in Latvia, thsd.ha



# Projections of wheat production in Latvia, thsd.t.



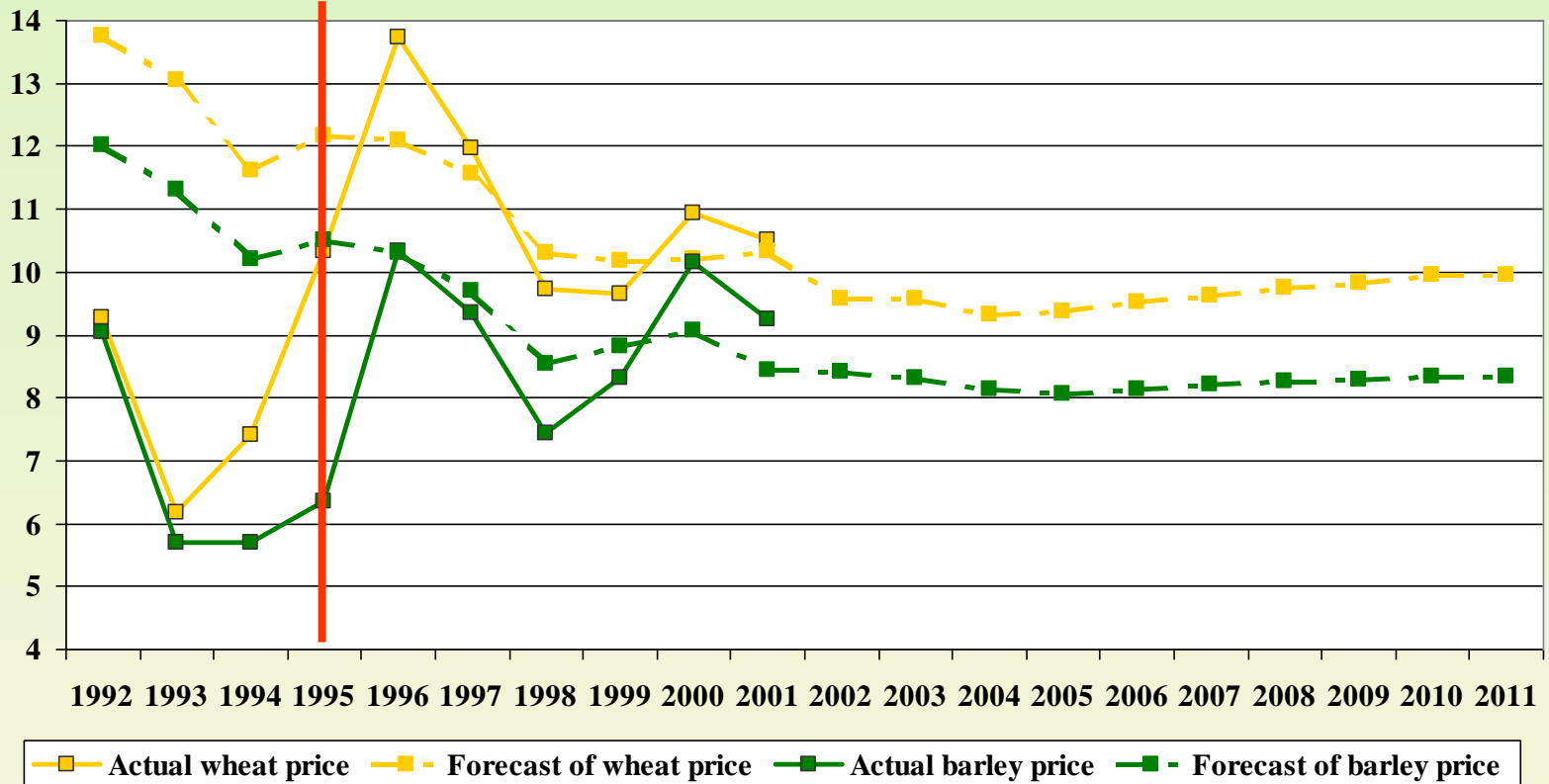
## **Data problems: (3) the economical processes are not stable during the period from 1990 to 2001**

- ❑ Transition period from centralized economic system to market economy;**
- ❑ Russian crises;**
- ❑ Sharp increase in level of world grain prices in 1996**

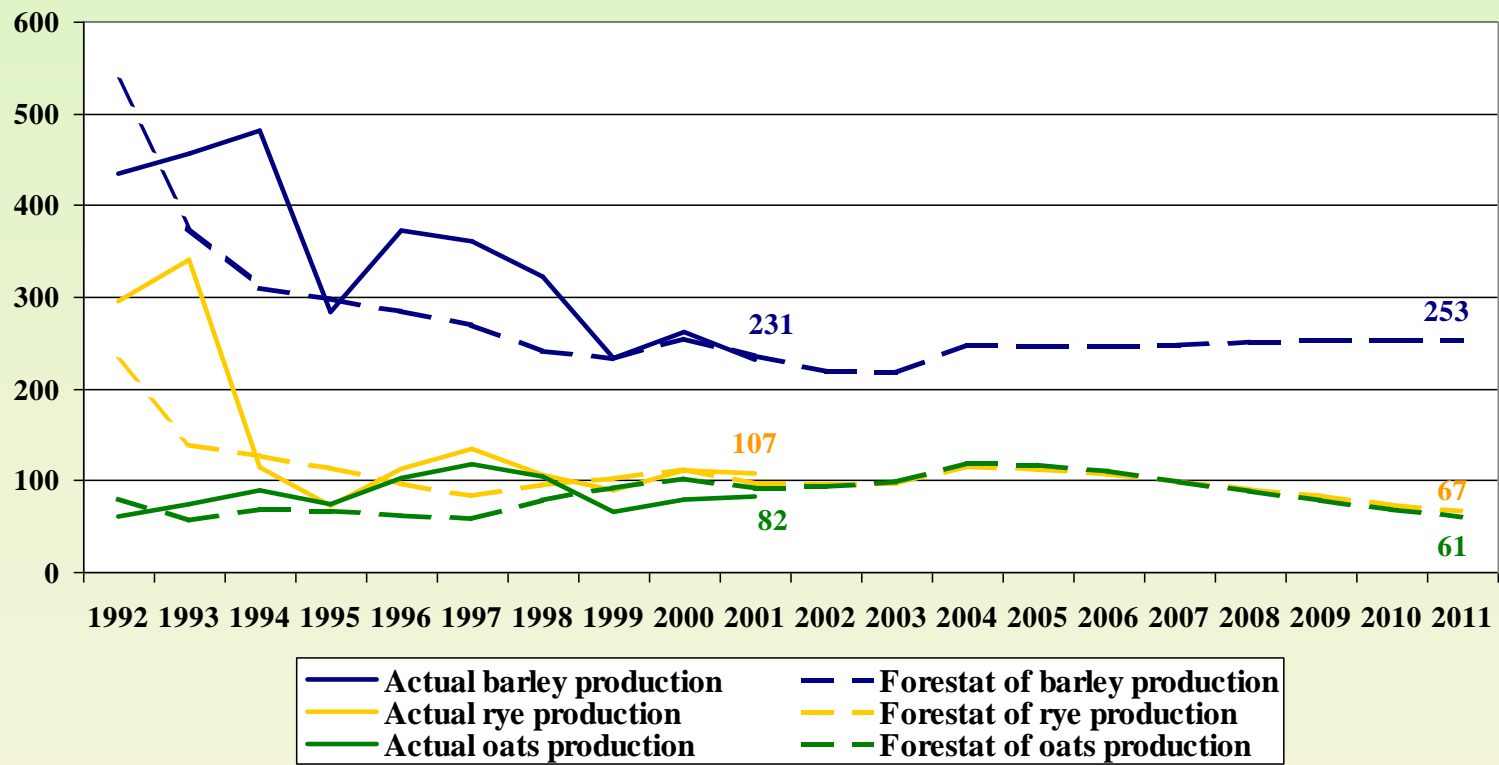




# The price forecasts for different types of grain in Latvia, EUR/100kg



# Forecasts for production of barley, rye and oats in Latvia, thsd.t.



# Conclusions

- To neglect first years of the transition;**
- To use more recent data (to add year 2002);**
- To calculate moving averages;**
- To use expert estimation in case of scarcity of data;**
- To use various data sources;**
- To make priorities in usage of different data sources (similar to AgrIS data base)**



# The main restrictions for Latvian Grain Model

- ❑ **There is no production costs analysis (exception for feeding requirements);**
- ❑ **The farm structure is not analysed at all;**
- ❑ **The time series were analysed for the period from 1990 to 2001 (2002 is not added still);**
- ❑ **The feedback from “Trade Block” to “Price Block” is not introduced in the model;**
- ❑ **The separate elements of CAP and “national” policy are combined in the model.**



# The main policy assumptions: (1)

- ❑ **Production in cattle, pig, milk and poultry sectors assumed relatively stable until 2011 (0,1% increase annually);**
- ❑ **The level of national direct support in 2003 will remain on the level of 2002;**
- ❑ **The effect of direct payments on the market revenues is assumed with the coefficient 0,9 ( in calculations of adjusted 3-grain gross return);**
- ❑ **Since 2004 the level direct payments will be 55% of EU level with the gradual increasing up to 100% in 2011;**
- ❑ **The national intervention price level in 2003 will remain on the level of 2002. After 2004 the EU intervention price level is assumed.**



## **The main assumptions about macroeconomic indicators (2)**

- ❑ The Latvian currency (LVL) will be kept until 2011;**
- ❑ Stability of USD will not be the increased in the future (in opposite to FAPRI forecasts);**
- ❑ The stable position of EUR will be observed in the future as well;**



# Assumptions about prices, yield levels and model parameters (3)

Barley key price also used for oats and rye;

- ❑ Three year average price series are used in gross return calculations;
- ❑ “the feedback extrapolation” were used for calculations of price level for the period from 1992 to 1994;
- ❑ Latvian grain price is depend on French grain price level;
- ❑ The average grain yield will be 2,5 and 3 t/ha correspondently in 2004 and 2010;
- ❑ Symmetry condition is applied for parameters in feed requirement functions:

$$\text{WS UFE} = f1 (\text{BA PFR}), b1=20$$

$$\text{BA UFE} = f2 (\text{WS PFR}), b2=20$$

