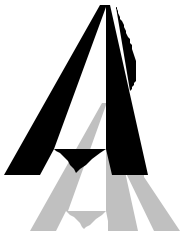

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Comparative Analysis of World Market Projections with Special Regard to Wheat Prices

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Comparative Analysis of World Market Projections with Special Regard to Wheat Prices

Abstract

This paper presents a short comparative analysis of USDA and FAPRI projections for world wheat market prices until 2005. The relevance of different model assumptions regarding assumed inflation, exchange rates, policy parameters as well as shifts in demand and production development are discussed. A subsequent section focuses on the problem of a "world market price concept" for evaluating the potential of unsubsidized EU cereal exports. The Annex provides more detailed information on model assumptions and a comparison of other projected values, also including agricultural products other than wheat.

Zusammenfassung

Dieses Diskussionspapier stellt eine kurze vergleichende Analyse aktueller USDA- und FAPRI-Projektionen von Weltmarktpreisen für Weizen bis 2005 vor. Die Relevanz verschiedener Modellannahmen hinsichtlich Inflation, Wechselkurs, Politikparameter und Bestimmungsgrößen von Angebot und Nachfrage werden diskutiert. Einige Überlegungen zur Problematik eines "Weltmarktpreiskonzeptes" bei der Abschätzung des Potentials unsubventionierter EU Getreideexporte schließen sich an. Der Anhang stellt detailliertere Informationen zu Modellannahmen sowie den Vergleich weiterer projezierter Kennzahlen bereit, die auch andere Agrarprodukte einschließen.

1 Background

Recently, there has been an intensive discussion on the possibility of a structural change in the development of world market prices for cereals. The combination of

- an expected continuous growth of population and income in developing countries (e.g. China) implying increased demand and change of demand structure and
- the limited availability of the resources land and water and - already observed - reductions in productivity gains

lead analysts to *long term forecasts*[1] expecting that the future development of agricultural world market prices will show at least smaller rates of decline in real terms than have been observed in the past.

From the EU policy perspective, however, *medium term forecasts* are specifically relevant, because world market prices below the intervention price would lead to a rapid increase in EU stock levels[2] due to the GATT restrictions on subsidised exports. Existing price projections differ with respect to the relation between world market and intervention prices and leave the policy makers with a high degree of uncertainty.

Therefore, this paper presents

- a comparison of several projections of world market prices for wheat (Section 2),
- an analysis of the relevance of certain model assumptions underlying the price projections (Section 3),
- problems of the "world market price" concept (Section 4),
- a summary and concluding interpretation of the results with respect to the possibility of unsubsidized EU cereal exports (Section 5),
- additional information on price projections for other products and the volume of corresponding production, consumption and trade as well as the main assumptions leading to the price projections (Annex).

[1] see **IFPRI** 1995, **FAO** 1995, **OECD** 1998

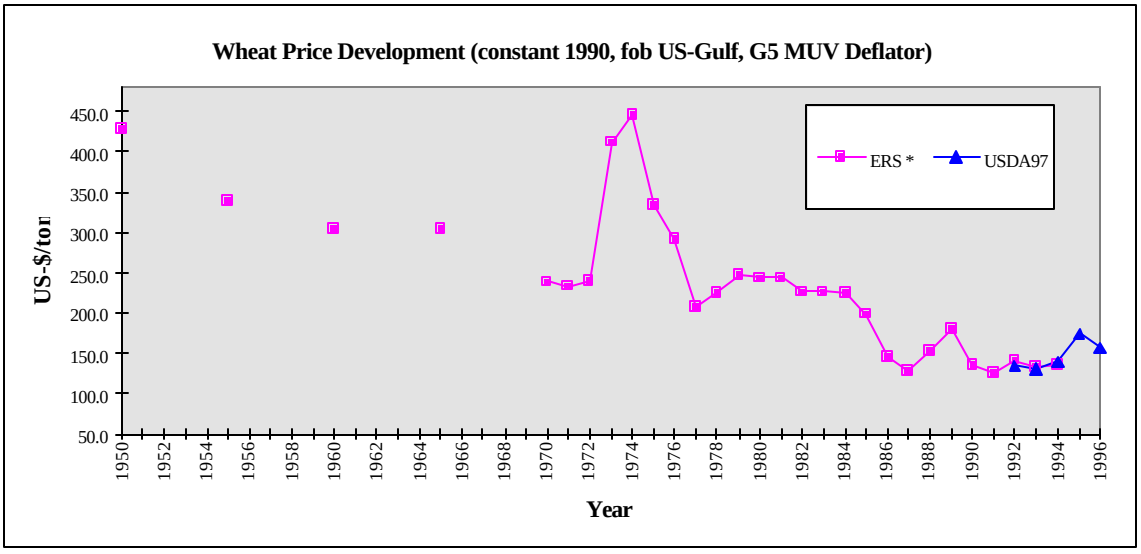
[2] see **EU Commission:** Long term Prospects, Grain, Milk & Meat Markets, Luxembourg , April 1997

2 Comparison of Wheat Price Forecasts

A comparison of four recent projections of wheat price developments until 2005 produced by the Food and Agricultural Policy Research Institute (FAPRI97, FAPRI98) and the US Department of Agriculture (USDA97, USDA98)[3] is presented in this section. Projections for other products can be found in the Annex.

Figure 1 shows the observed wheat prices for the period 1950 to 1996. In real terms wheat prices decreased over time with an average rate of -2.5%, but show a peak during the oil crisis in the seventies. An important point for the interpretation of the projections is the development in 1995/96 where prices were above the five previous years due to an extraordinary combination of different circumstances (Pinstrup-Andersen 1997).

Figure 1: Wheat Price Development from 1950 to 1996



*) Economic Research Service, USDA.
Source: USDA 1997, ERS 1997

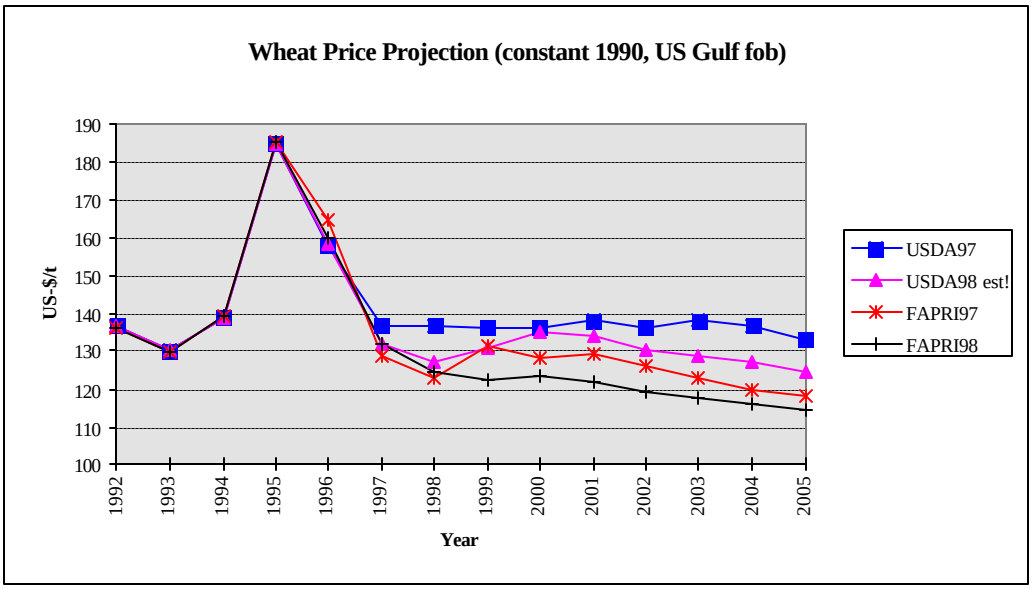
All four price projections expect continuing decreasing *real* wheat prices from 1997 to 2005, however, with different growth rates (Table 1). USDA97 projects wheat prices in real terms of 133

[3] They published:

- **USDA:** International Agricultural Baseline Projection to 2005, Washington DC, May 1997 (USDA97)
  Agricultural Baseline Projection to 2007 (national), Washington DC, February 1998 (USDA98)
- **FAPRI:** World Agricultural Outlook, Iowa, January 1997 (FAPRI97)
  World Agricultural Outlook, Iowa, March 1998 (FAPRI98)

US$/t in 2005, whereas the FAPRI97 forecasts are considerably lower with 118 US$/t for this year. In the 1998 projections, both teams reduce their projected levels taking into account most recent developments on wheat markets (Figure 2, Table 1 and Annex).

Figure 2: Wheat Price Projection



*) USDA98 est!: USDA's Baseline Projection to 2007 gives just the national US farm-gate price as a projection towards 2007. Under the assumption of unchanged transaction costs, the difference from 1997 forecast between farm-gate and fob Gulf price is added (26 US-$/t over the whole period).
Source: FAPRI 1997, FAPRI 1998, USDA 1997, USDA 1998

Compared with 1992 the projected prices until 2005 will change with an average rate of -1.01% (FAPRI97), -1.23% (FAPRI98), -0.21% (USDA97) or -0.68% (USDA98). Therefore, all projections expect at least a diminished rate of real price decline compared to the period from 1950 to 1995.

In comparison, the WATSIM model (with the data base of 1992) predicts an annual reduction of -2.2% from 1992 to 2005 for the "unit value export"[4] .

[4] **IAP:** The effects of a world wide liberalisation of the markets for cereals, oilseeds and pulses on agriculture in the European Union, Luxembourg, 1997 (WATSIM (92); newest model-run (8.4.1998) with an assumed set-aside-rate of 17.5%. Because price data are often lacking, the results given by the model must be interpreted primarily as price changes - the absolute levels are mostly *unit values*, sometimes only estimates, and must therefore be interpreted with caution. Since the model operates with relative price changes, however, this is not a major limitation for the simulation results.

Table 1: Nominal and Real Price Projections Wheat (US-$/t)

Year		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
constant 1990															
US Gulf, fob	USDA97	137	130	139	185	158	137	137	136	136	138	136	138	137	133
US-$/t	USDA98 est!	137	130	139	185	158	132	127	131	135	134	131	129	127	124
	FAPRI97	136	130	139	185	165	129	123	131	128	130	126	123	120	118
	FAPRI98	136	130	139	185	160	132	125	122	124	122	119	118	116	115
current															
US Gulf, fob	USDA97	144	140	154	209	184	164	167	171	176	184	187	197	202	202
US-$/t	USDA98 est!	144	140	154	209	184	157	155	164	174	179	179	182	186	188
	FAPRI97	144	140	154	209	190	152	149	163	163	169	169	169	169	171
	FAPRI98	144	140	154	209	184	155	150	151	157	159	160	162	164	166
current															
EU intervention price	USDA97						148	148	148	149	151	153	156	159	159
US-$/t	USDA98						147	147	147	149	151	153	155	157	158
	FAPRI97				190	180	168	167	168	168	169	170	171	172	173
	FAPRI98					139	135	137	139	141	142	143	144	144	145
Relativ difference between projected US Gulf fob price and EU intervention price															
	USDA97						11%	13%	15%	18%	22%	23%	26%	27%	27%
	USDA98						7%	5%	11%	17%	18%	18%	18%	18%	19%
	FAPRI97				10%	6%	-10%	-11%	-3%	-3%	0%	-1%	-1%	-2%	-1%
	FAPRI98					32%	15%	9%	9%	11%	12%	12%	13%	14%	14%

Source: FAPRI 1997, FAPRI 1998, USDA 1997, USDA 1998

3 Relevance of Model Assumptions

In all reported projections, a constant wheat intervention price at 119 ECU/t is assumed. Consequently, both the projected deflator and US-$/ECU exchange rate used to calculate nominal prices in a single currency have a significant influence on the relation between the US Gulf fob and the EU intervention price.

The influence of inflation on EU-export possibilities

USDA and FAPRI use different inflation rates (GDP deflators) to project *nominal* prices (Table 2). The USDA deflators exceed FAPRI deflators, explaining 4% of the overall 13% relative difference between USDA98 and FAPRI98 projections of the nominal US fob Gulf price.

Due to the constant EU intervention price this relative difference directly translates to the difference between US fob Gulf and the intervention price, resulting in a significantly more favourable evaluation of EU export possibilities by USDA only due to a higher projected inflation rate. For comparison, Table 2 includes the G5 MUV Deflator of the World Bank, which is rather similar to the FAPRI deflator considering the uncertainties in projecting future inflation rates. The G5 MUV deflator is used in the next section to calculate „deflator-comparable“ projected prices.

Table 2: The G5-MUV-Deflator[5] in comparison to USDA's and FAPRI's GDP-Deflator

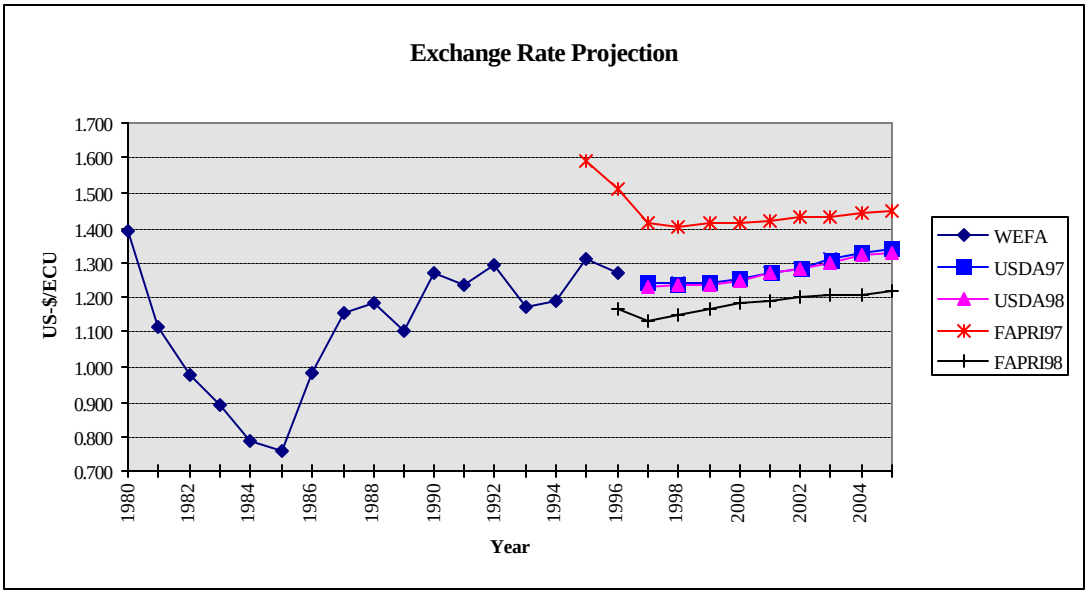
constant 1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
USDA97	1.053	1.081	1.104	1.128	1.162	1.190	1.216	1.250	1.302	1.339	1.385	1.425	1.467	1.517
USDA98	1.053	1.081	1.104	1.128	1.162	1.186	1.214	1.250	1.289	1.332	1.375	1.418	1.462	1.508
FAPRI97	1.053	1.081	1.104	1.128	1.153	1.181	1.210	1.241	1.272	1.305	1.339	1.373	1.409	1.446
FAPRI98	1.053	1.081	1.104	1.128	1.150	1.174	1.204	1.237	1.271	1.306	1.341	1.376	1.412	1.449
World Bank (G5 MUV)	1.066	1.063	1.102	1.194	1.164	1.184	1.210	1.243	1.276	1.307	1.338	1.370	1.403	1.436

Source: The World Bank 1996, USDA 1997, USDA 1998, FAPRI 1997, FAPRI 1998

The influence of exchange rates on EU-export possibilities

The projected US-$/ECU exchange rate is also very important for the evaluation of the possibility for unsubsidized EU-exports. A low US-$/ECU exchange rate lowers EU intervention prices expressed in US-$ increasing the potential of unsubsidized EU exports.

Figure 3: Exchange Rate Projection by different Institutions



Source: USDA 1997, USDA 1998, FAPRI 1997 (The WEFA Group 1996), FAPRI 1998

The USDA analysts expect (see Figure 3) that the ECU will strengthen relative to the dollar during the projection period, reflecting tighter fiscal and monetary policies in EU member states as they prepare for the European Monetary Union. They assume a rate of more than 1.33 US-$/ECU for 2005 which is much higher than the currently observed rate (1.13 US $/ECU). This assumption does

[5] Unit value index in US dollar terms of manufactures exported from G-5 countries (France, Germany, Japan, UK and US), weighted proportionally to the countries ' exports to the developing countries (see **World Bank** 1996).

not change from the 1997 to the 1998 projection[6]. Consequently, EU intervention prices measured in US-$ remain constant between projections of USDA97 and USDA98 for 2005 (see Table 1).

Contrary, the FAPRI team changed their assumption on exchange rates for 2005 from around 1.45 US-$/ECU (FAPRI97) to 1.22 US-$/ECU (FAPRI98). Therefore, the US Gulf fob price for 2005 of FAPRI98 lies almost 14% above the projected EU intervention price (see Table 1), whereas FAPRI97 still projected a world market price below the intervention price. In this respect, the exchange rate adjustment considerably overcompensated the slight downward correction of the world market price in US-$ from FAPRI97 to FAPRI98.

In the year 2005, the exchange rate effect implies about 9% higher US Gulf fob prices in ECU for FAPRI98 compared to USDA98. Looking at deflator and exchange rate effect together, FAPRI98 assumptions result in 5% higher US Gulf fob prices in ECU than would have been obtained with assumptions from USDA98.

Sensitivity Analysis of Model assumptions

The information on response behaviour of world markets implied by the specific ation of the FAPRI and USDA model is rather limited. Therefore, results of additional sensitivity analyses are reported in this section, based on calculations with the WATSIM (92) model of the IAP. They indicate the orders of magnitude by which different assumptions regarding EU-policies as well as production and consumption developments in certain regions of the world influence world market prices. They also show the interdependencies between different agricultural products, especially between cereal and meat markets. Some results of this analyses are shown in Table 3 and Table 4 (For additional information on market shares of "global players" see Annex 7.5.)

1. At first it was analysed how different **set-aside rates** in the EU influence world market prices. If the set-aside rate would be reduced from 17.5% to 10% the world market price for wheat and maize would decrease by -3% and -2% respectively, whereas barley prices would decrease by -5%. The higher sensitivity of barley prices is due to the fact that the EU is the biggest barley exporter in the world. It can be also inferred from this analysis that the introduction of set-aside rates in the EU increased world market price levels during the last years. Since FAPRI98

[6] USDA 1998, p. 102

assumes the set-aside rate to be at 5%, USDA at 10% (see Annex). One could infer an implied world wheat price difference of around 2% from the sensitivity analysis above.

Table 3: Impacts of EU-policy assumptions

	Wheat	Barley	Maize	Poultry	Pigmeat
Change of...	**...leads to a world market price change of:**				
...set-aside rate in the EU from 17.5% to 10%	-3.00%	-5.14%	-2.14%	-0.43%	-0.43%
...set-aside rate in the EU from 17.5% to 0%	-7.00%	-12.00%	-5.00%	-1.00%	-1.00%
Change of...	**...leads to an EU production change of:**				
...set-aside rate in the EU from 17.5% to 10%	+4.30%	+6.30%	+5.90%	+0.10%	+0.10%
...set-aside rate in the EU from 17.5% to 0%	+10.00%	+14.70%	+13.80%	+0.20%	+0.20%
Change of...	**...leads to an EU consumption change of:**				
...set-aside rate in the EU from 17.5% to 10%	+0.07%	+0.15%	-0.06%	+0.08%	+0.07%
...set-aside rate in the EU from 17.5% to 0%	+0.12%	+0.25%	-0.10%	+0.14%	+0.12%

Source: Own simulation runs with the WATSIM (92) model

2. The level of world **wheat** prices strongly depends on consumption and production developments in China because of the size of this country. For example, if wheat production in China increased by 1%, world wheat prices would decrease by 0.7%. At the same time barley prices would be reduced by 0.33% due to substitution effects on the demand and supply side. For developments of **barley** markets especially changes in the CIS countries are important. A price drop of 1.06% is calculated for a an increased production of 1% in these countries. The reactions of other cereal prices are less significant.
3. Meat prices are nearly unaffected by changes on cereal markets, however, changes in meat consumption have a considerable influence on cereal prices, especially barley. The model results show that a 1% increase of pigmeat and poultry consumption in China results in a 0.07% and 0.41% increase in wheat prices, respectively, and about twice the effect on barley prices. A proportional change of production and consumption of these meat products in China, however, has only a minimal effect on cereal prices.

Table 4: Flexibility of world market prices

	Wheat	Barley	Maize	Poultry	Pigmeat
One percent change of ...	**...leads to a world market price change of :**				
...Wheat Production in China	-0.69%	-0.33%	-0.15%	-0.04%	-0.02%
...Barley Production in CIS-States	-0.14%	-1.06%	-0.08%	-0.03%	-0.02%
...Poultry Consumption in China	0.07%	0.13%	0.11%	0.30%	0.03%
...Pig Meat Consumption in China	0.41%	0.84%	0.63%	0.26%	0.96%
...Poultry Production and Consumption in China	0.02%	0.03%	0.06%	0.01%	0.00%

...Pig Meat Production and Consumption in China	0.08%	0.09%	0.22%	0.03%	0.00%

Source: Own simulation runs with the WATSIM (92) model

Points 2 and 3 show that future world market prices for cereals strongly depend on the relative growth rates of production and consumption in China for cereals and meat products.

4 The Problem of a "World Market Price" Concept

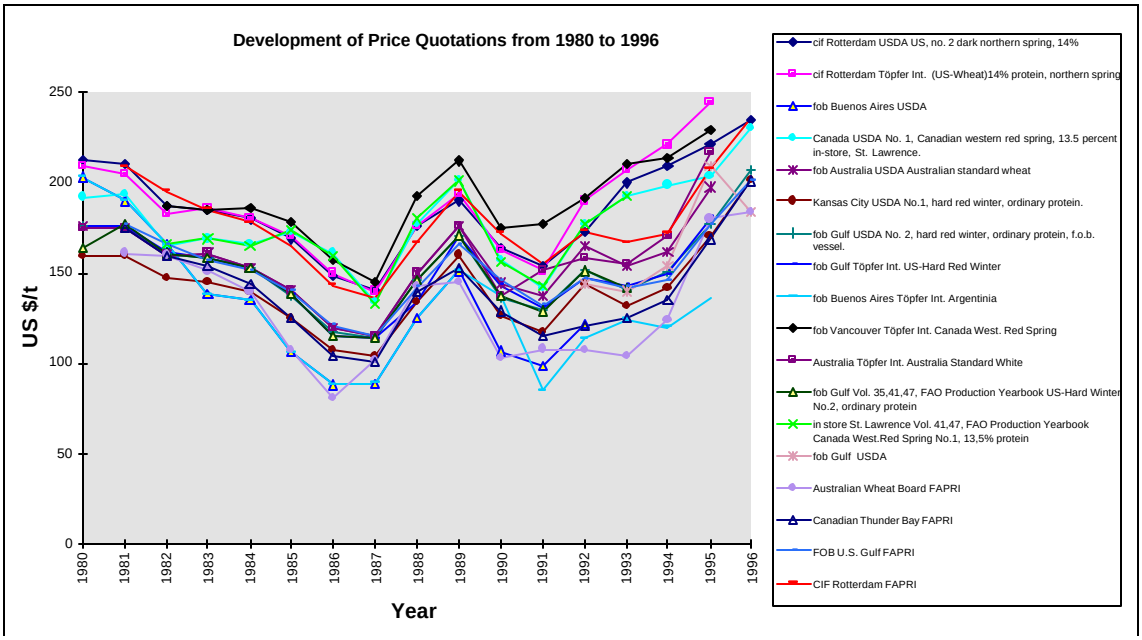
This section looks at the usefulness of a "world market price" concept in terms of deriving EU export possibilities. Figure 4 shows a comparison of different price quotations for wheat. The effect of different qualities, locations and cif/fob conditions on the price levels and variations are considerable. The differences between the lowest and the highest prices are varying from 50 to 100 US-$/t. Even if the cif prices are reduced by the freight rates (10 to 15 US-$/t from the US Gulf to Rotterdam or Thailand to Rotterdam[7]) the price differences are still very high which reveals the inhomogeneity of the product wheat and the problem of defining a "world market price".

Looking at weekly or monthly price variations even accentuates this problem. In the last 10 years the price gaps between lowest and highest prices were varying between 16 US-$/t in 1987 and 68 US-$/t in 1993 even if attention is restricted to US wheat quoted cif Rotterdam[8].

Figure 4: Comparison of Different Price Quotations for Wheat

[7] See TOEPFER INTERNATIONAL (1996): Statistische Informationen 1996/97, p. 103

[8] See TOEPFER INTERNATIONAL (1996): Statistische Informationen 1996/97, p. 98



Source: */*

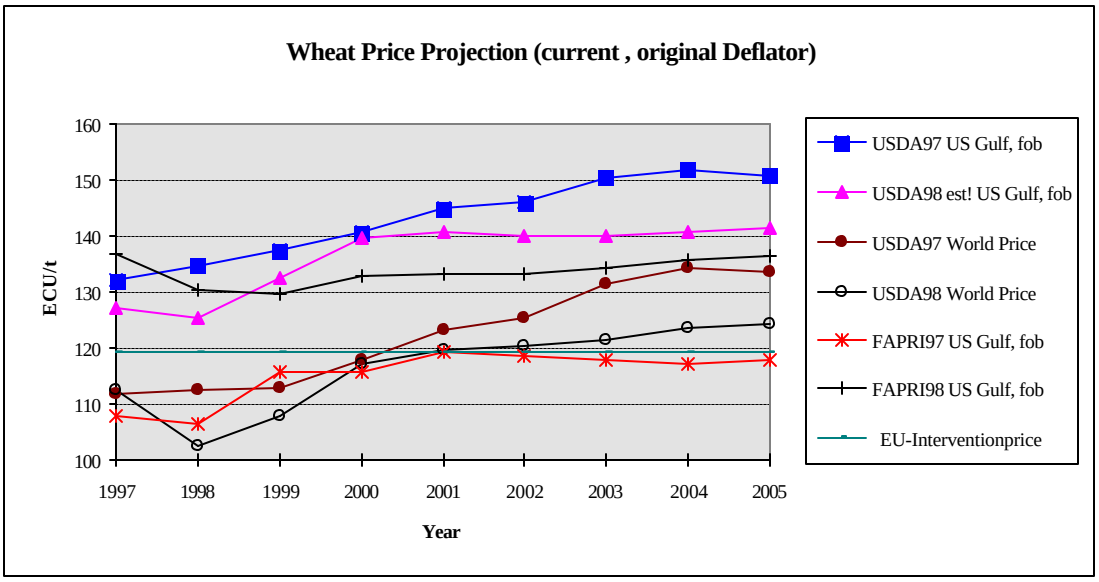
This quick glance at price quotations shows that

- an obvious choice for a "world market price" does not exist
- a simple comparison between EU intervention price and price quotations fob US Gulf is insufficient for evaluating the potential of unsubsidized exports
- quality differences between the - on average - lower EU quality and better US quality need to be considered
- prices at the EU port of export are more relevant than the intervention price

To get more detailed information on these issues an in depth study on international wheat trade is necessary.

The USDA group has apparently acknowledged some of the above considerations, because they report a "world price" - generally lower than "US fob Gulf" - which is not defined in detail, but serves as a reference for unsubsidized EU exports. This world price will reach the intervention price first in 2001 and the USDA argues in 1997 that the EU-15 will have no problems to export wheat in the next decade because intervention prices are below world market prices after 2001. The simple comparison of EU intervention prices with USDA US fob Gulf projections, on the other hand, would suggest that export possibilities are existing already in 1998 (Figure 5).

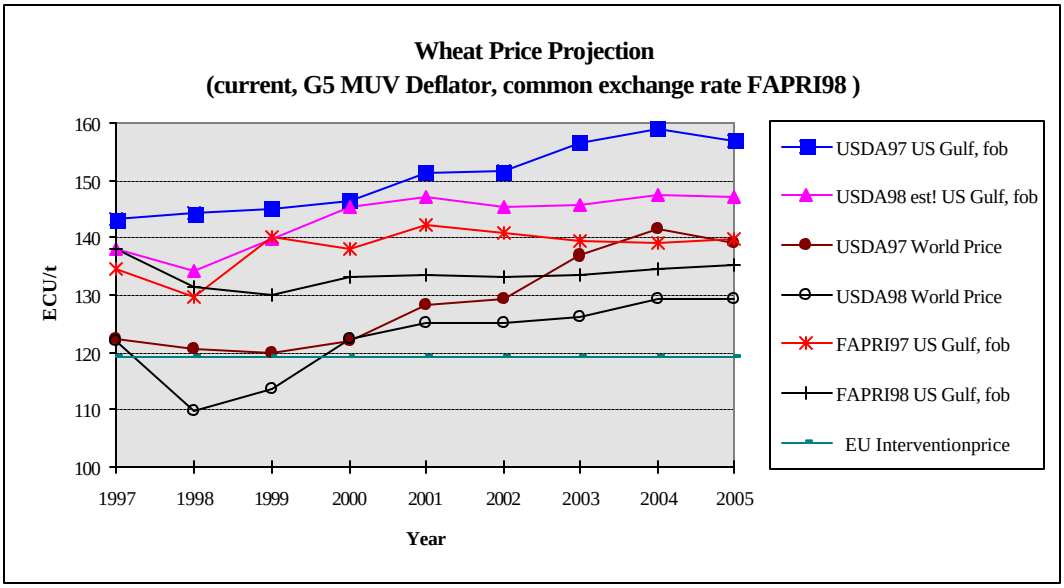
Figure 5: Comparison of Projected World Market and Intervention Prices



Source: USDA 1997, USDA 1998, FAPRI 1997, FAPRI 1998 and own calculations

In Figure 6 the projected *real* wheat prices were *uniformly inflated* by the G5 MUV Deflator of the World Bank and a *uniform* FAPRI98 *exchange rate* was used to convert US-$ to ECU. Therefore, the price relations between the four different projections now only relate to other model characteristics than the assumed deflator and exchange rate. EU export possibilities *under this deflation and exchange rate scenario* are more favourable than in Figure 5 for USDA and the FAPRI97 projections. The USDA98 „world price“ is now above the EU intervention price starting in year 2000. Note again, however, that lower inflation rates and higher US-$/ECU exchange rates than the ones employed in Figure 6 would imply a lower EU export potential.

Figure 6: Comparison of Projected World Market and Intervention Prices



Source: USDA 1997, USDA 1998, FAPRI 1997, FAPRI 1998 and own calculations

Apart from the intransparent definition of the USDA's world market price, no quantitative information on the relationship between price projections and unsubsidized export levels exist. However, having observed unsubsidized EU wheat exports in the past, there exist at least an indication on the necessary price differences between "US fob Gulf" and the intervention price (see Table 5): In the year 1995/1996 the wheat price US fob Gulf was on average 39% higher than the intervention price and reached in some month 170% of the intervention price. This enabled exports without paying subsidies. In December 1995, unsubsidized exports started at a price gap of 30%. The simultaneously raised export tax continued until September 1996.

One might be lead to conclude that the price projections of the FAPRI98 and USDA98 for 2005, which show US Gulf fob prices at maximum 14% up to 19% higher (Table 1), would not allow the EU-exporters to export unsubsidised. However, the monthly variations of the price gaps in Table 5 show that these exports could be nevertheless possible for short time periods during the year. FAPRI97 even argues for US Gulf fob price projections which do not reach the intervention price at any time, that the EU will still be able to export wheat unsubsidised in some months due to price variations over time.

Table 5: Monthly Wheat Price Analysis

Month	US GULF fob, Hard Red Winter No.2, ordinary	Exchange Rate US-$/ECU	US GULF fob, Hard Red Winter No.2, ordinary	Intervention plus Reports (ECU/t)	Rel. Difference US Gulf fob and EU	Intervention Price (ECU/t)	Rel. Difference US Gulf fob and EU

	Protein (US-$/t)		Protein (ECU/t)		Intervention plus Reports		Intervention
Apr-93	145	1.22	119	162.68	-26.85%	153.68	-22.57%
May-93	138	1.22	113	164.18	-31.17%	153.68	-26.47%
...							
Nov-93	146	1.13	130	116.92	11.19%	115.49	12.56%
Dec-93	159	1.13	141	118.34	19.15%	115.49	22.09%
Jan-94	158	1.11	142	119.77	18.56%	115.49	22.95%
Feb-94	149	1.12	133	121.19	9.75%	115.49	15.16%
Mar-94	143	1.14	125	122.62	1.94%	115.49	8.23%
Apr-94	143	1.14	126	124.04	1.58%	115.49	9.10%
May-94	142	1.16	122	125.47	-2.77%	115.49	5.64%
...							
Nov-94	163	1.24	131	107.8	21.52%	106.60	22.89%
Dec-94	164	1.22	135	109	23.85%	106.60	26.64%
Jan-95	160	1.24	129	110.2	17.06%	106.60	21.01%
Feb-95	156	1.26	124	134.52	-7.82%	128.72	-3.67%
Mar-95	150	1.32	114	135.97	-16.16%	128.72	-11.44%
Apr-95	151	1.34	113	137.42	-17.77%	128.72	-12.21%
May-95	163	1.32	123	138.87	-11.43%	128.72	-4.44%
...							
Nov-95	205	1.32	155	120.49	**28.64%**	119.19	**30.04%**
Dec-95	213	1.3	163	121.79	**33.84%**	119.19	**36.76%**
Jan-96	211	1.29	163	123.09	**32.42%**	119.19	**36.76%**
Feb-96	221	1.29	172	124.39	**38.27%**	119.19	**44.31%**
Mar-96	217	1.28	169	125.69	**34.46%**	119.19	**41.79%**
Apr-96	257	1.26	203	126.99	**59.86%**	119.19	**70.32%**
May-96	258	1.25	207	128.29	**61.35%**	119.19	**73.67%**
...							
Nov-96	177	1.28	139	120.29	15.55%	119.19	16.62%
Dec-96	179	1.25	143	121.39	17.80%	119.19	19.98%
Jan-97	177	1.22	146	122.49	19.19%	119.19	22.49%
Feb-97	172	1.17	148	123.59	19.75%	119.19	24.17%
Mar-97	176	1.15	153	124.69	22.70%	119.19	28.37%
Apr-97	184	1.14	161	125.79	27.99%	119.19	35.08%
May-97	171	1.15	149	126.89	17.42%	119.19	25.01%
...							
Nov-97	151	1.14	133	120.19	10.66%	119.19	11.59%
Dec-97	146	1.11	131	121.19	8.09%	119.19	9.91%
Jan-98	141	1.09	130	122.19	6.39%	119.19	9.07%
Feb-98	142	1.09	130	123.19	5.53%	119.19	9.07%

Source: 'Agrarwirtschaft', various issues and own calculation

5 Summary and Conclusions

The results of this study can be summarized by the following points:

- the analysed wheat price projections of FAPRI and USDA all show at least a diminished decline of real wheat prices in US-$ until 2005 compared with ex-post developments from 1950 to 1996
- past developments are however characterised by considerable year to year fluctuations
- in addition, the level of the price gap between the US fob Gulf price and the EU intervention price - relevant for the potential of unsubsidized EU-exports and resulting stock levels - depends on the expected inflation and the US-$/ECU exchange rate
- the price difference between the (yearly) US fob Gulf price for wheat and the intervention price alone does not allow to quantify the level of unsubsidized wheat exports of the EU
- sensitivity analyses further showed that the growth rates of production and consumption for cereal and meat products in China have a strong influence on world market prices for wheat and barley. Consequently, market conditions for exporters in the future will considerable depend on the rate of income growth and the corresponding changes in demand structure in this region.

With regard to the possibility of unsubsidized EU-exports, it can be concluded that the most recent projections of world market prices for wheat show more favourable conditions in the medium term than have been observed during the last years (except for a few months in 95/96). The yearly prices alone, however, do not allow to project the level of these unsubsidized exports. A detailed analysis of short term price variations and their effect on export levels in the past might be desirable with regard to the importance of this issue for projected stock levels in the EU.

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7 Annex

7.1 Projected Exchange Rates

Table 6: Exchange Rate Projections US-$/ECU

US-$/ECU	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
WEFA	1.294	1.171	1.186	1.307	1.269									
USDA97						1.243	1.240	1.244	1.252	1.270	1.280	1.309	1.330	1.338
USDA98						1.231	1.235	1.237	1.247	1.269	1.280	1.300	1.319	1.329
FAPRI97				1.594	1.510	1.410	1.401	1.410	1.410	1.418	1.426	1.435	1.443	1.451
FAPRI98					1.166	1.133	1.149	1.166	1.183	1.191	1.200	1.208	1.208	1.217

Source: FAPRI 1997 (WEFA Group), FAPRI 1998, USDA 1997, USDA 1998

7.2 Nominal and real price projections (barley, soybeans)

Table 7: Nominal and real price projections barley (US-$/t, Marketing Year)

	Years	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
current															
FOB U.S. Pacific Northwest	FAPRI97	118	110	117	159	144	133	128	131	135	137	136	137	140	142
	FAPRI98					151	135	128	128	131	132	133	135	136	138
EU Intervention	FAPRI97	243	164	153	190	180	168	167	168	168	169	170	171	172	173
	FAPRI98					139	135	137	139	141	142	143	144	144	145
constant 1990															
FOB U.S. Pacific Northwest	FAPRI97	112	102	106	141	125	113	106	106	106	105	102	100	99	98
	FAPRI98					131	115	106	103	103	101	99	98	96	95
EU Intervention	FAPRI97	231	152	139	168	156	143	138	135	132	130	127	124	122	119
	FAPRI98					121	115	113	113	111	109	107	104	102	100

Source: FAPRI 1997, FAPRI 1998, USDA 1997, USDA 1998

Table 8: Nominal and real price projections soybeans (US-$/t, Marketing Year)

	Years	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
current															
fob US Gulf	FAPRI97				267	270	247	232	230	235	237	241	245	250	258
	FAPRI98					289	258	233	235	235	237	239	241	245	247
cif Rotterdam	USDA97	246	259	248	304	274	259	252	252	261	272	281	294	300	301
	FAPRI97				304	305	282	267	266	271	273	276	280	285	293
	FAPRI98					302	278	254	255	256	258	259	262	265	267
constant 1990															
fob US Gulf	FAPRI97				237	234	209	192	185	185	182	180	178	177	178
	FAPRI98					251	220	194	190	185	181	178	175	173	170
cif Rotterdam	USDA97	234	240	225	269	236	218	207	202	201	203	203	206	205	198
	FAPRI97				269	264	239	221	214	213	209	206	204	202	203
	FAPRI98					263	237	211	206	201	197	193	190	188	185

Source: FAPRI 1997, FAPRI 1998, USDA 1997, USDA 1998

7.3 Comparison of different wheat price quotations

Table 9: Comparison of different price quotations (wheat, US-$/t)

Wheat	Source	quality	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
cif Rotterdam	USDA	US, no. 2 dark northern spring, 14%	213	210	187	185	180	169	148	141	176	190	164	154	173	200	210	221	235
cif Rotterdam	Töpfer Int.	(US-Wheat)14% protein, northern spring	209	205	183	186	181	170	150	140	176	194	163	151	190	207	221	245	
CIF Rotterdam	FAPRI			209	195	185	178	165	143	136	167	195	172	155	173	167	172	208	236
fob Buenos Aires	USDA		203	190	166	138	135	106	88	89	125	151	107	99	122				
Canada	USDA	No. 1, Canadian western red spring, 13.5 percent in-store, St. Lawrence.	192	194	165	169	166	173	161	134	177	202	158	141	177	192	199	204	230
fob Australia	USDA	Australian standard wheat	176	175	160	161	153	141	120	115	150	176	144	137	165	154	162	198	
Kansas City	USDA	No.1, hard red winter, ordinary protein.	159	160	147	145	140	125	107	104	134	160	126	117	144	132	142	170	201
fob Gulf	USDA	No. 2, hard red winter, ordinary protein, f.o.b. vessel.	176	176	161	158	153	137	117	114	146	171	137	129	152	141	150	177	207
fob Gulf	Töpfer Int.	US-Hard Red Winter	176	176	162	158	153	138	115	114	134	170	143	131	147	143	149	181	
fob Buenos Aires	Töpfer Int.	Argentinia	203	190	166	138	135	106	88	89	125	151	137	85	114	124	120	136	
fob Vancouver	Töpfer Int.	Canada West. Red Spring			187	185	186	178	157	145	193	212	175	177	191	210	214	229	
Australia	Töpfer Int.	Australia Standard White	175	175	160	161	153	141	120	115	150	176	137	152	158	155	170	217	
fob Gulf	Vol. 35,41,47, FAO Production Yearbook	US-Hard Winter No.2, ordinary protein	164	177	161	158	153	138	115	114	146	171	137	129	151	142			
in store St. Lawrence	Vol. 41,47, FAO Production Yearbook	Canada West.Red Spring No.1, 13,5% protein			166	169	165	174	159	133	180	201	156	143	177	193			
fob Gulf	USDA														144	140	154	209	184
Australian Wheat Board	FAPRI			161	160	151	140	107	81	102	143	145	103	108	107	104	124	180	184
Canadian Thunder Bay	FAPRI			175	159	154	144	125	104	101	139	153	129	115	121	125	135	169	201
FOB U.S. Gulf	FAPRI			177	166	157	151	140	121	115	142	166	146	132	147	142	146	177	201

Source: */*

7.4 Comparative Analysis of Production, Consumption and Net-trade Forecasts

7.4.1 World Market

Table 10 shows the projected production for major agricultural products in 2005. All studies project increased production but the implied growth rates are different. They are the result of complex interactions between projected supply and demand shifts, price reaction parameters and assumed agricultural policies for the different regions of the world. Some effects of different assumptions are considered here for the case of the EU.

Table 10: Predicted agricultural production in the world for 2005 (mio t)

	1994	USDA97	FAPRI98	WATSIM
Wheat	528	654	643	731
Maize	570	687	672	654
Barley	161	170	169	207
Rice	536	616	419**	696
Soybeans	136	156	169	150
Pigmeat*	66	82	94	91
Beef*	32	31	34	36
Poultry*	34	56	50	46

* The 5 biggest producer in the world ** husked rice

7.4.2 European Union

Market developments depicted in the models depend on projections of:

- internal agricultural price policies
- set-aside policies
- other agricultural policy measures
- supply and demand shifts such as technical progress, population, income etc.

Different set-aside rates for Grandes Cultures in the European Union are assumed by the various model teams and the EU-Commission:

Table 11: Set-aside rates for Grandes Cultures

		1997	1998	1999	2000	2001	2002	2003	2004	2005
Set-aside rate EU (%)	**USDA97**	5	15	12	12	12	12	12	12	12
	USDA98	5	5	5	10	10	10	10	10	10
	FAPRI97	5	10	10	10	10	10	10	10	10
	FAPRI98	5	5	5	5	5	5	5	5	5
	EU Commission	5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
	WATSIM (92)									17.5

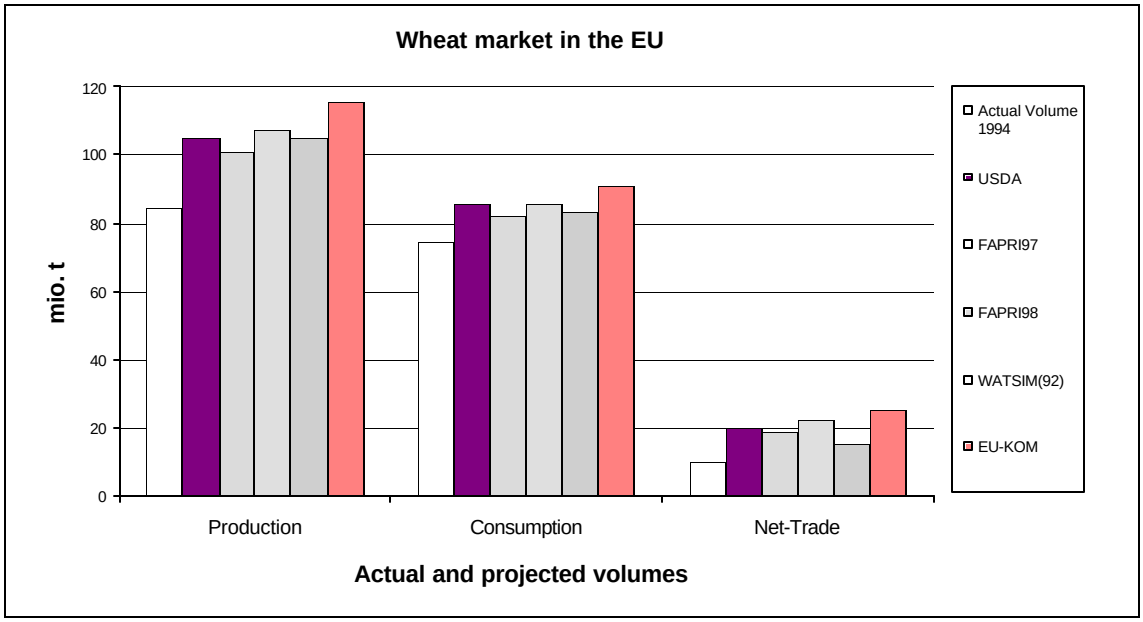
Source: FAPRI 1997, FAPRI 1998, USDA 1997, USDA 1998, EU Commission, IAP

The EU-Commission and the IAP assume a 17.5% set-aside rate. USDA and FAPRI changed their assumptions from 1997 to 1998 from 12% to 10% and from 10% to 5%, respectively.

The following graphs show results of projected production, consumption and net-trade for the main agricultural products in the EU. It is always the actual (1994) volume given in comparison to the projected volumes for 2005. USDA data is only available for the USDA97 projection.

On the **wheat market** (Figure 7) the EU Commission expects the highest production with 115 mio.t in 2005[9] (despite a set-aside rate of 17.5%) together with the highest demand of 90 mio.t leading to a net-trade of 25 mio.t for wheat. Using the same set-aside rate the WATSIM(92) model projects only a production of 104 mio.t. Quite similar are the projections of FAPRI and USDA, although the set-aside rates are lower. One of the differences between FAPRI97 and FAPRI98 is the higher production forecast by the latter which is a plausible effect of a lower set-aside rate and higher world market prices for wheat (assuming that this price affects the EU farm level price as inferred from FAPRI expectation of unsubsidized export possibilities).

Figure 7: Comparison of different projections for the wheat market in the EU for 2005

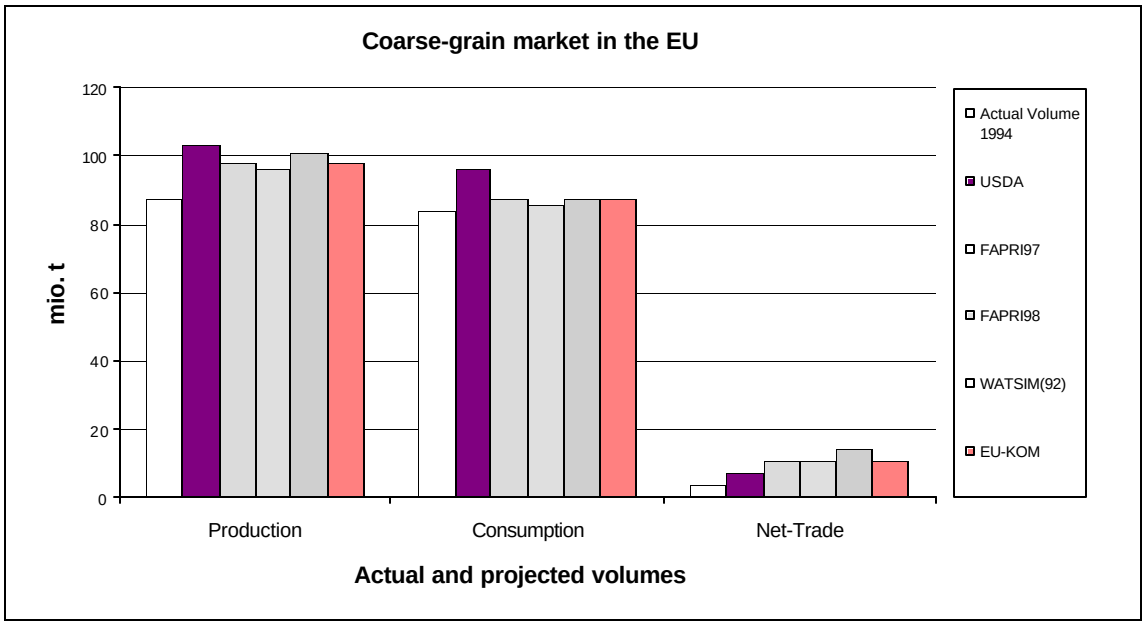


Source: USDA 1997, FAPRI 1997, FAPRI 1998, EU Commission, IAP

[9] The high projection value is resulting from the assumption on area allocation. Although the Commission assumes an increasing set-aside-rate from 10% in 1996 to 17.5% in 1998 the volume of cereal area is only reduced by -1.7%, see **EU Commission:** op.cit.

For **coarse grains** (Figure 8) the USDA outlook estimates the highest production (well above 100 mio.t), parallel to a high consumption (96 mio.t). The other forecasts (FAPRI, EU Commission and WATSIM(92)) are quite similar each other and do expect a net-trade volume of about 10 mio.t.

Figure 8: Comparison of different projections for the coarse-grain market in the EU for 2005

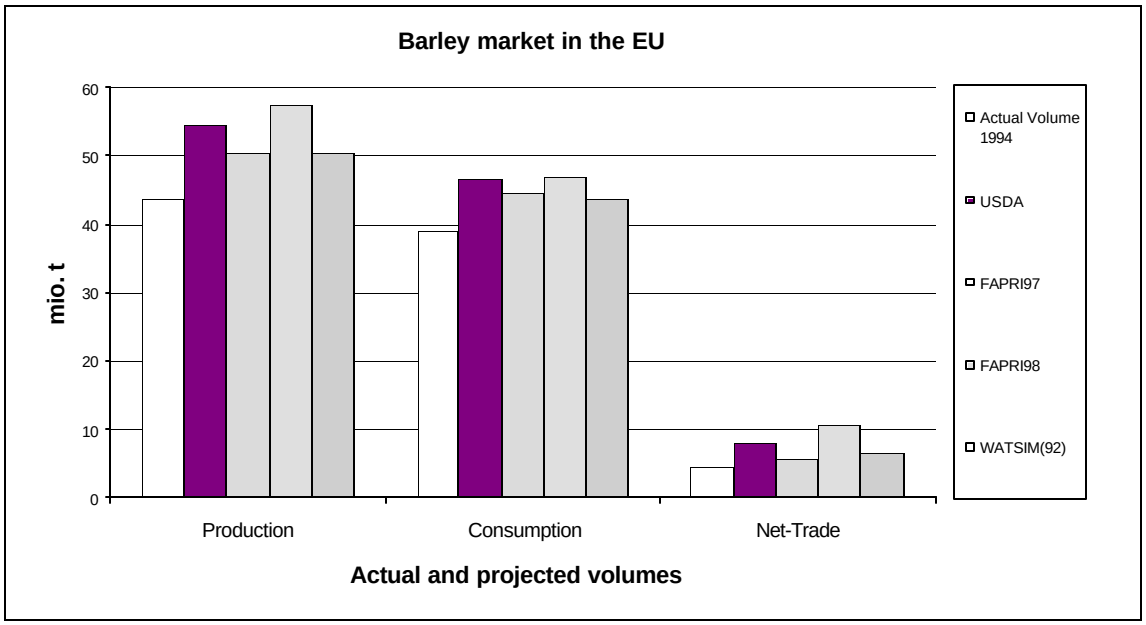


Source: USDA 1997, FAPRI 1997, FAPRI 1998, EU Commission, IAP

Looking at the **barley market**[10] (Figure 9), FAPRI changes its projection of barley production (up 7 mio.t) in the forecast 1998 compared to 1997, accompanied by increased net-exports of nearly 5 mio.t. (reaching 10.67 mio.t in 2005). This is in contrast to the USDA projection, which expects nearly the same demand volume (47 mio.t), but only 55 mio.t of production and resulting net export of 8 mio. t.

[10] Projections of the EU Commission are only available for total coarse grains, see **EU Commission:** Long term Prospects, Grain, Milk & Meat Markets, Luxembourg , April 1997 (EU-COM), p. 19-27

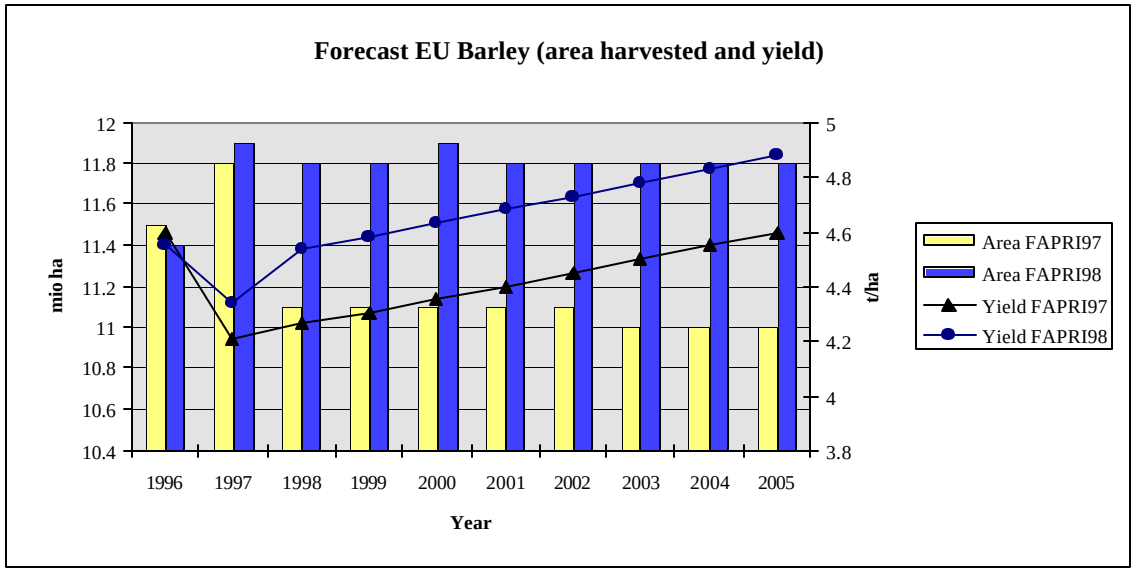
Figure 9: Comparison of different projections for the barley market in the EU for 2005



Source: USDA 1997, FAPRI 1997, FAPRI 1998, IAP

To get an idea why the FAPRI projections 1997 and 1998 are different , the next figure gives an overview about estimated EU barley area and yield:

Figure 10: Harvested area and yield of barley in the EU

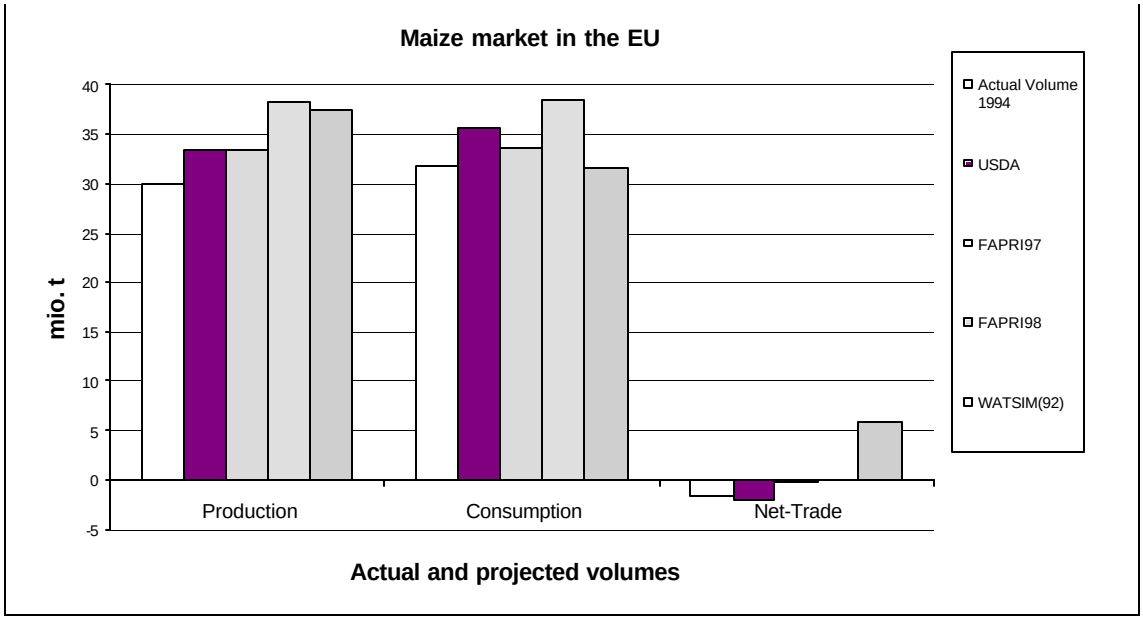


Source: FAPRI 1997, FAPRI 1998

FAPRI expects an increase of more than 6% in harvested barley area by changing the set-aside rate from 10% to 5% in forecast 1998. Additionally, they expect more than 6% increase in barley yields compared to 1997 projection.

Regarding the net-trade position a quite different development can be seen on the **maize market** (Figure 11). FAPRI98 compared to FAPRI97 forecasts a sharp increase in EU maize production in connection with a high demand and reduced corn imports by more than half (250.000 t to 120.000 t in 2005). Higher net-imports are projected from the USDA, whereas WATSIM (92) expects a net-export of more than 5 mio.t, due to an increasing maize production and nearly unchanged maize consumption.

Figure 11: Comparison of different projections for the maize market in the EU for 2005



Source: USDA 1997, FAPRI 1997, FAPRI 1998, IAP

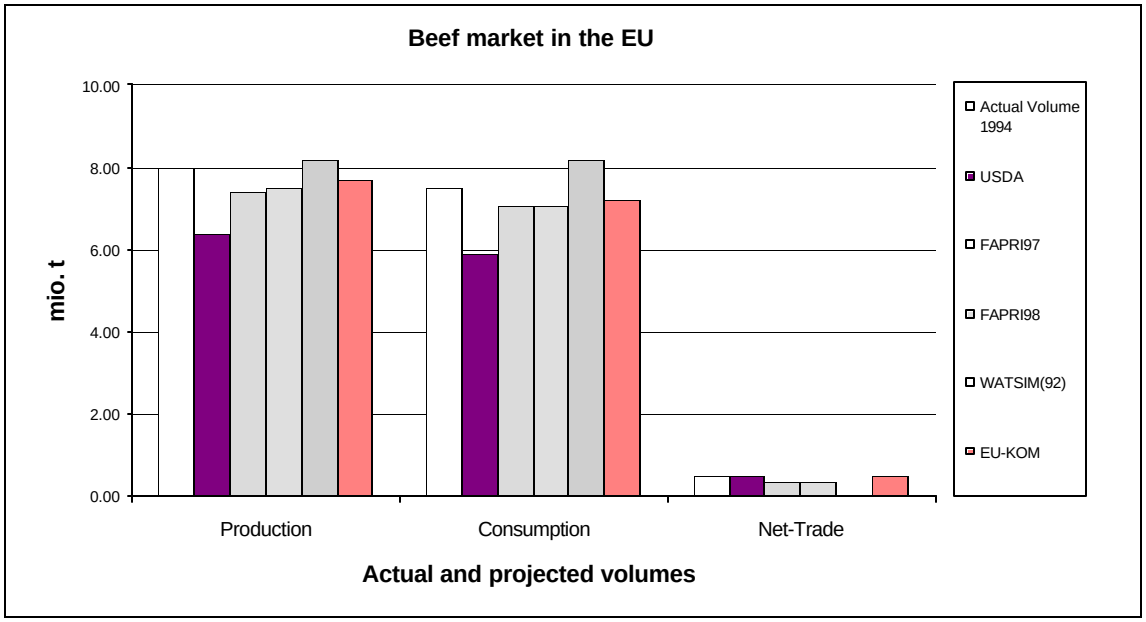
In summary, the comparison shows that the EU cereal production and consumption developments are primarily caused by different assumptions on set-aside-rates and technical progress in yield developments. In their own projection, the EU Commission argues, without any detailed price analysis, that unsubsidized exports under the condition of unchanged agricultural policies are probably not possible after 2001 and therefore stocks would grow to a high level. This is rather pessimistic compared with the US projections.

The livestock markets of the European Union are influenced by several crisis which occurred in the mid 1990‘s. The BSE crisis and the outbreak of Classical Swine Fever (CSF) have caused temporary shifts in consumption. **Beef** consumption is projected to continue the gradual decline

between 1994 and 2005 with -2.15% annually (USDA97) or -0.5% annually estimated by FAPRI97 and FAPRI98 respectively (Figure 12).

FAPRI98 estimates an production surplus of 72.000 t which is added annually to stocks and project beef stocks climbing to over 1.3 mio. t in 2005 (in comparison to 822.000 t GATT maximum for subsidised exports p.a., FAPRI98). WATSIM(92) projection was distinguished by the expectation that BSE and CSF will have a small, short run impact and an immediate recovery. Thus production and consumption are in balance in 2005

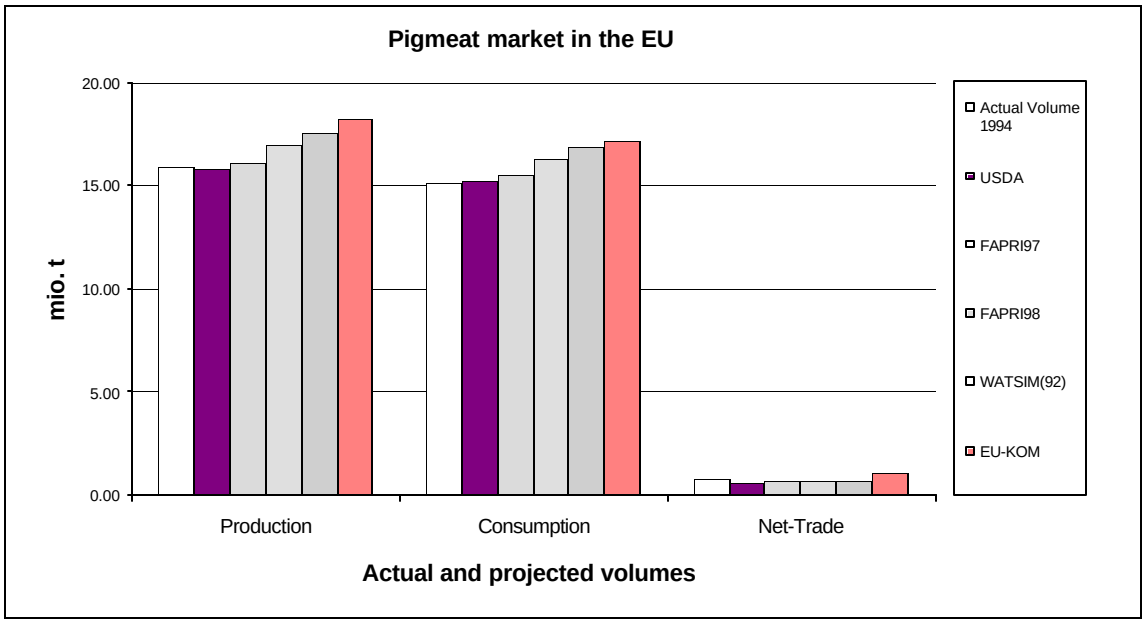
Figure 12: Comparison of different projections for the beef market in the EU for 2005



Source: USDA 1997, FAPRI 1997, FAPRI 1998, EU Commission, IAP

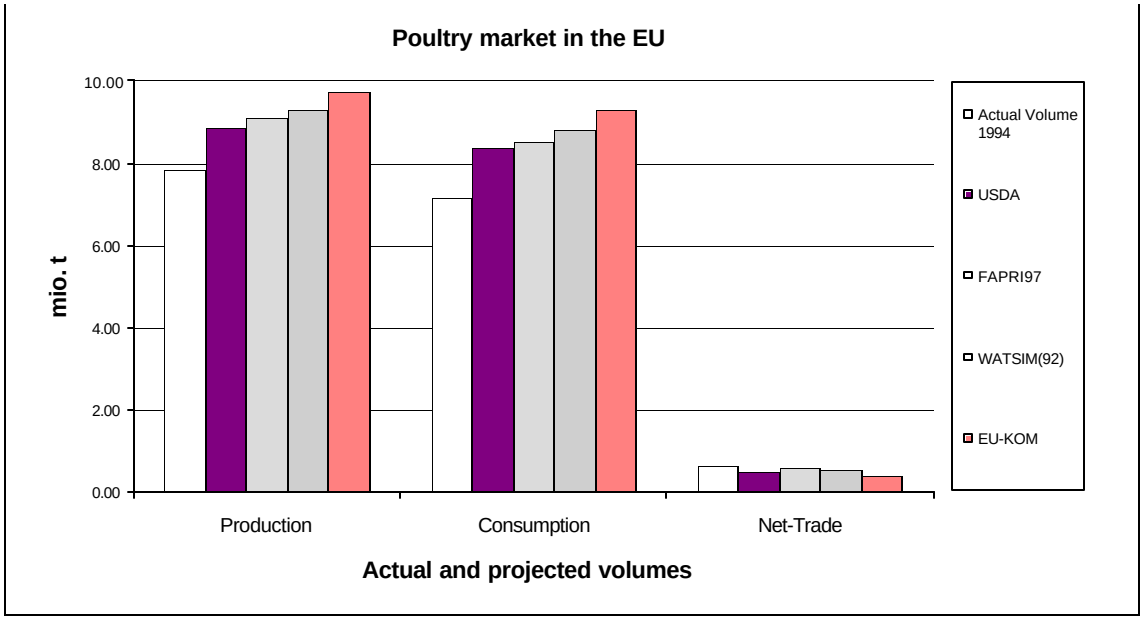
On the EU **pigmeat** market (Figure 13) only USDA expects a decrease of production by -0.11% p.a. and a nearly unchanged demand. All other projections show moderate growth rates for production and similar rates for consumption. Thus the net trade position is expected to be unchanged by 680.000 t up to 700.000 t in 2005. The most optimistic projection is made by the EU Commission with annual growth rate of +1.2% for production and +1.1% for consumption leading to an higher net export of 1.1 mio. t. in 2005.

Figure 13: Comparison of different projections for the pigmeat market in the EU for 2005



Source: USDA 1997, FAPRI 1997, FAPRI 1998, EU Commission, IAP

Figure 14: Comparison of different projections for the poultry market in the EU for 2005



Source: USDA 1997, FAPRI 1997, FAPRI 1998, EU Commission, IAP

The **poultry** production is expected to increase faster than production of pigmeat (+1.5% p.a. in average), in line with the rising demand in the EU. On the other hand, the EU is loosing world market shares by a steady drop of poultry net exports.

7.5 The 5 biggest Producers and Consumers on the world market in 2005 (Comparison of the projections of USDA and FAPRI)

Figure 15: Production on the world market (mio.t)


The Wheat World Market in 2005
200.00
150.00
100.00
50.00
0.00
China
India/Pak.
EU-15
CIS-Staates
USA
Other
ex-post 1994 Production Mio. t
USDA97 Production Mio. t
FAPRI98 Production Mio. t
The Maize World Market in 2005
300.00
250.00
200.00
150.00
100.00
50.00
0.00
USA
China
Brazil
EU-15
EEC
Other
ex-post 1994 Production Mio. t
USDA97 Production Mio. t
FAPRI98 Production Mio. t
The Barley World Market in 2005
60.00
50.00
40.00
30.00
20.00
10.00
0.00
EU-15
Canada
CIS-Staaten
EEC
USA
Other
ex-post 1994 Production Mio. t
USDA97 Production Mio. t
FAPRI98 Production Mio. t
The Rice World Market in 2005
250.00
200.00
150.00
100.00
50.00
0.00
China
India/Pak.
Indonesia
Banglade sch
Vietnam
Other
ex-post 1994 Production Mio. t
USDA97 Production Mio. t
FAPRI98 Production Mio. t
The Soybean World Market in 2005
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
USA
Brazil
Argentina
China
EU-15*
Other
ex-post 1994 Production Mio. t
USDA97 Production Mio. t
FAPRI98 Production Mio. t

Figure 16: Consumption on the world market (mio.t)

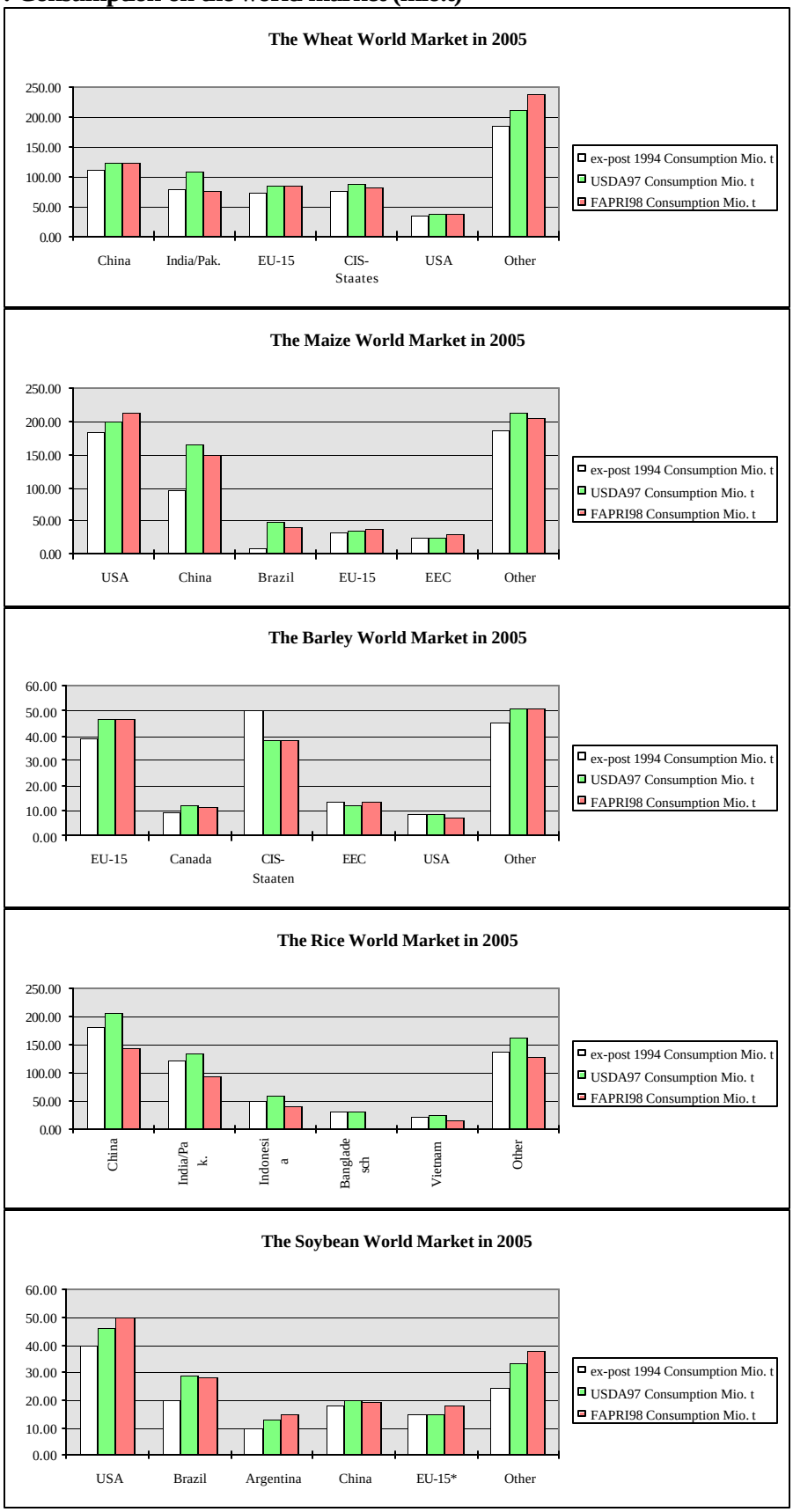


Figure 17: Net-Trade on the world market (mio.t)

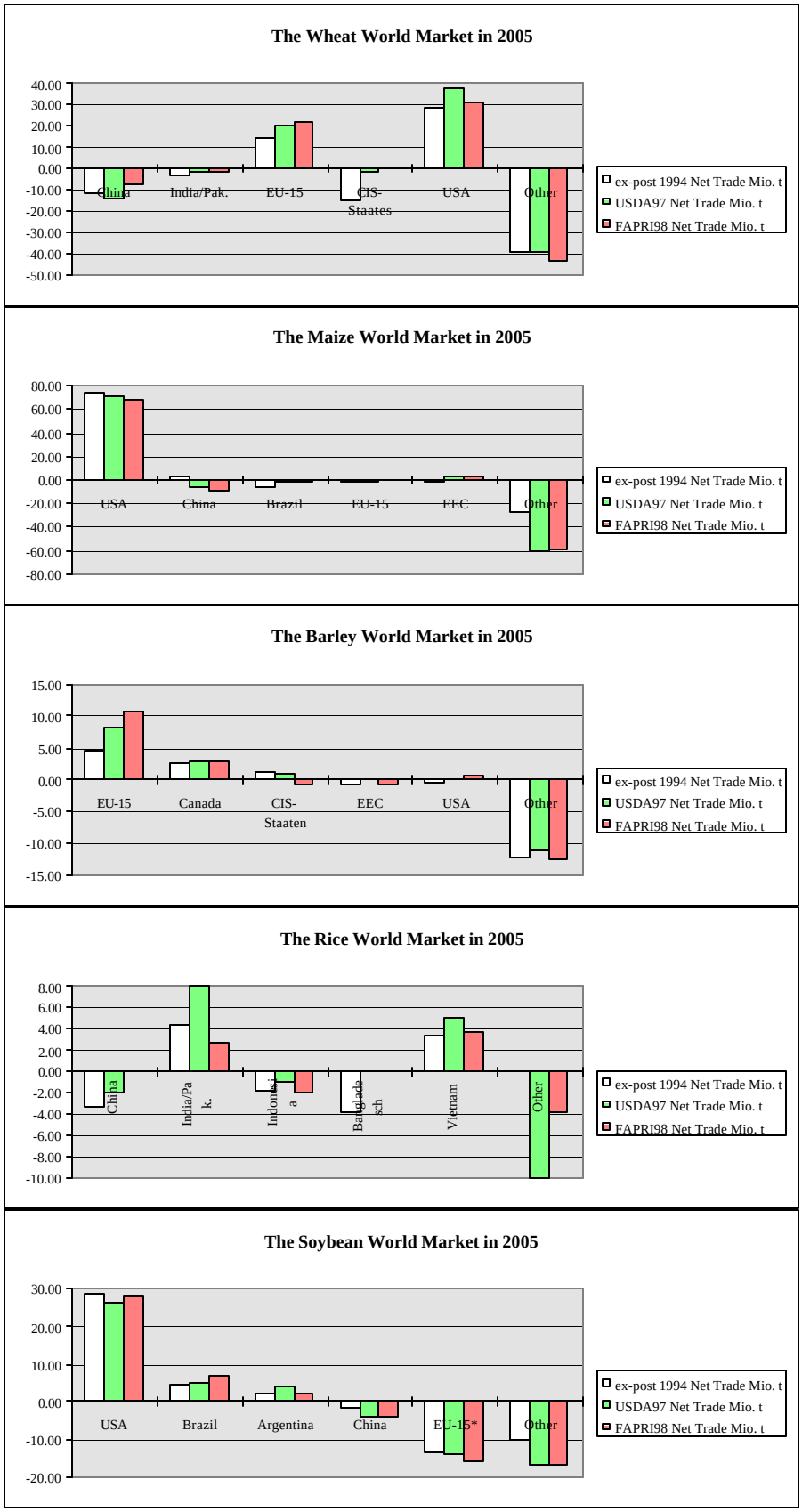
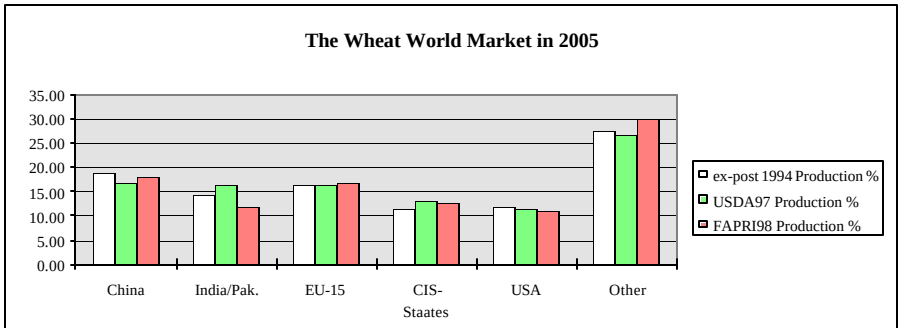
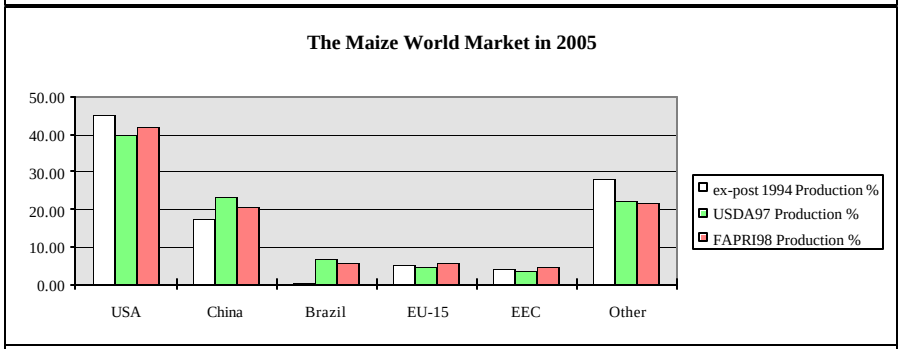
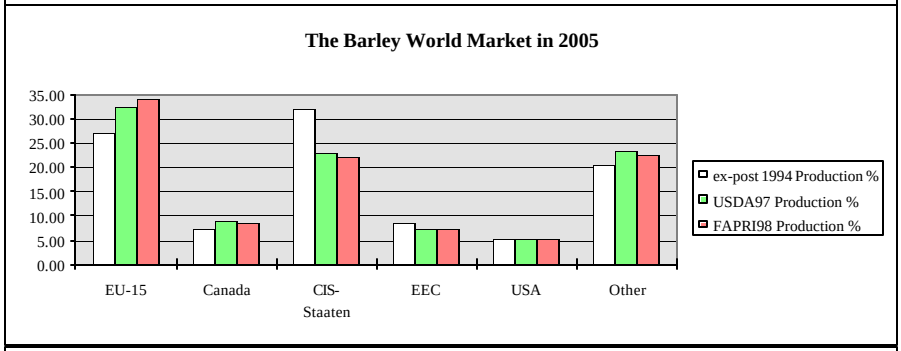
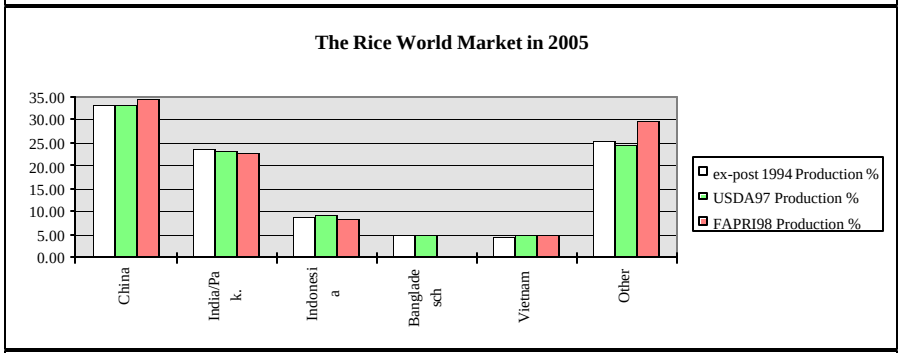

The Wheat World Market in 2005
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
-50.00
China
India/Pak.
EU-15
CIS-Staates
USA
Other
ex-post 1994 Net Trade Mio. t
USDA97 Net Trade Mio. t
FAPRI98 Net Trade Mio. t
The Maize World Market in 2005
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00
-80.00
USA
China
Brazil
EU-15
EEC
Other
ex-post 1994 Net Trade Mio. t
USDA97 Net Trade Mio. t
FAPRI98 Net Trade Mio. t
The Barley World Market in 2005
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
EU-15
Canada
CIS-Staaten
EEC
USA
Other
ex-post 1994 Net Trade Mio. t
USDA97 Net Trade Mio. t
FAPRI98 Net Trade Mio. t
The Rice World Market in 2005
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
-8.00
-10.00
China
India/Pak.
Indonesia
Bangladesch
Vietnam
Other
ex-post 1994 Net Trade Mio. t
USDA97 Net Trade Mio. t
FAPRI98 Net Trade Mio. t
The Soybean World Market in 2005
30.00
20.00
10.00
0.00
-10.00
-20.00
USA
Brazil
Argentina
China
EU-15*
Other
ex-post 1994 Net Trade Mio. t
USDA97 Net Trade Mio. t
FAPRI98 Net Trade Mio. t

Figure 18: Production share on the world market (%)


The Wheat World Market in 2005
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
China
India/Pak.
EU-15
CIS-Staates
USA
Other
ex-post 1994 Production %
USDA97 Production %
FAPRI98 Production %


The Maize World Market in 2005
50.00
40.00
30.00
20.00
10.00
0.00
USA
China
Brazil
EU-15
EEC
Other
ex-post 1994 Production %
USDA97 Production %
FAPRI98 Production %


The Barley World Market in 2005
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
EU-15
Canada
CIS-Staaten
EEC
USA
Other
ex-post 1994 Production %
USDA97 Production %
FAPRI98 Production %


The Rice World Market in 2005
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
China
India/Pak.
Indonesia
Bangladesch
Vietnam
Other
ex-post 1994 Production %
USDA97 Production %
FAPRI98 Production %

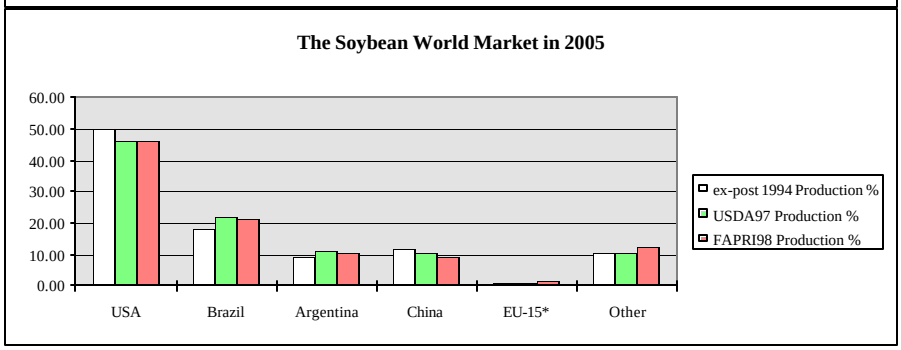

The Soybean World Market in 2005
60.00
50.00
40.00
30.00
20.00
10.00
0.00
USA
Brazil
Argentina
China
EU-15*
Other
ex-post 1994 Production %
USDA97 Production %
FAPRI98 Production %

Figure 19: Consumption share on the world market (%)

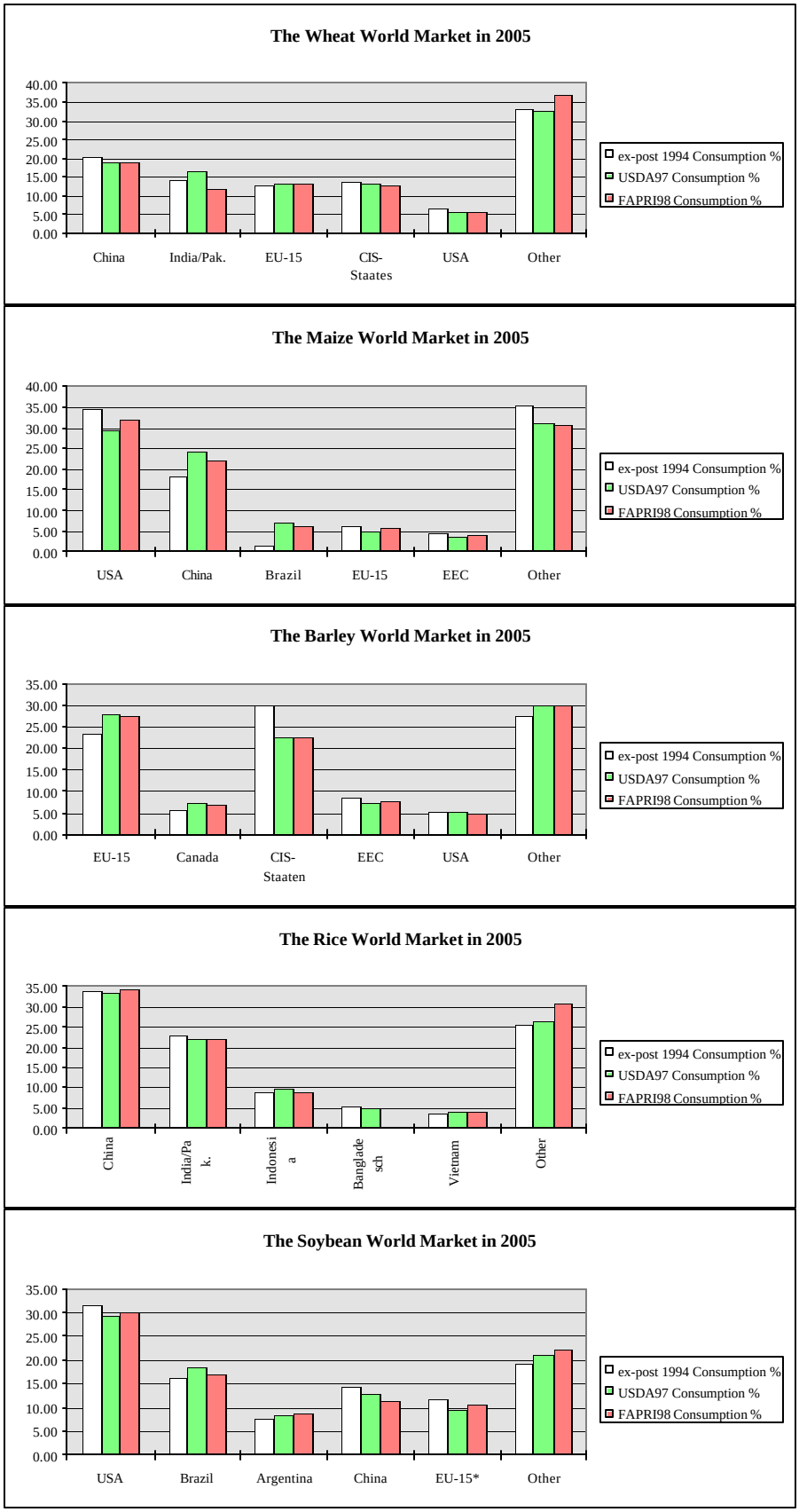

The Wheat World Market in 2005
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
China
India/Pak.
EU-15
CIS-Staates
USA
Other
ex-post 1994 Consumption %
USDA97 Consumption %
FAPRI98 Consumption %
The Maize World Market in 2005
USA
China
Brazil
EU-15
EEC
Other
ex-post 1994 Consumption %
USDA97 Consumption %
FAPRI98 Consumption %
The Barley World Market in 2005
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
EU-15
Canada
CIS-Staaten
EEC
USA
Other
ex-post 1994 Consumption %
USDA97 Consumption %
FAPRI98 Consumption %
The Rice World Market in 2005
China
India/Pak.
Indonesia
Bangladesch
Vietnam
Other
ex-post 1994 Consumption %
USDA97 Consumption %
FAPRI98 Consumption %
The Soybean World Market in 2005
USA
Brazil
Argentina
China
EU-15*
Other
ex-post 1994 Consumption %
USDA97 Consumption %
FAPRI98 Consumption %

Figure 20: Production on the world meat market (mio.t)

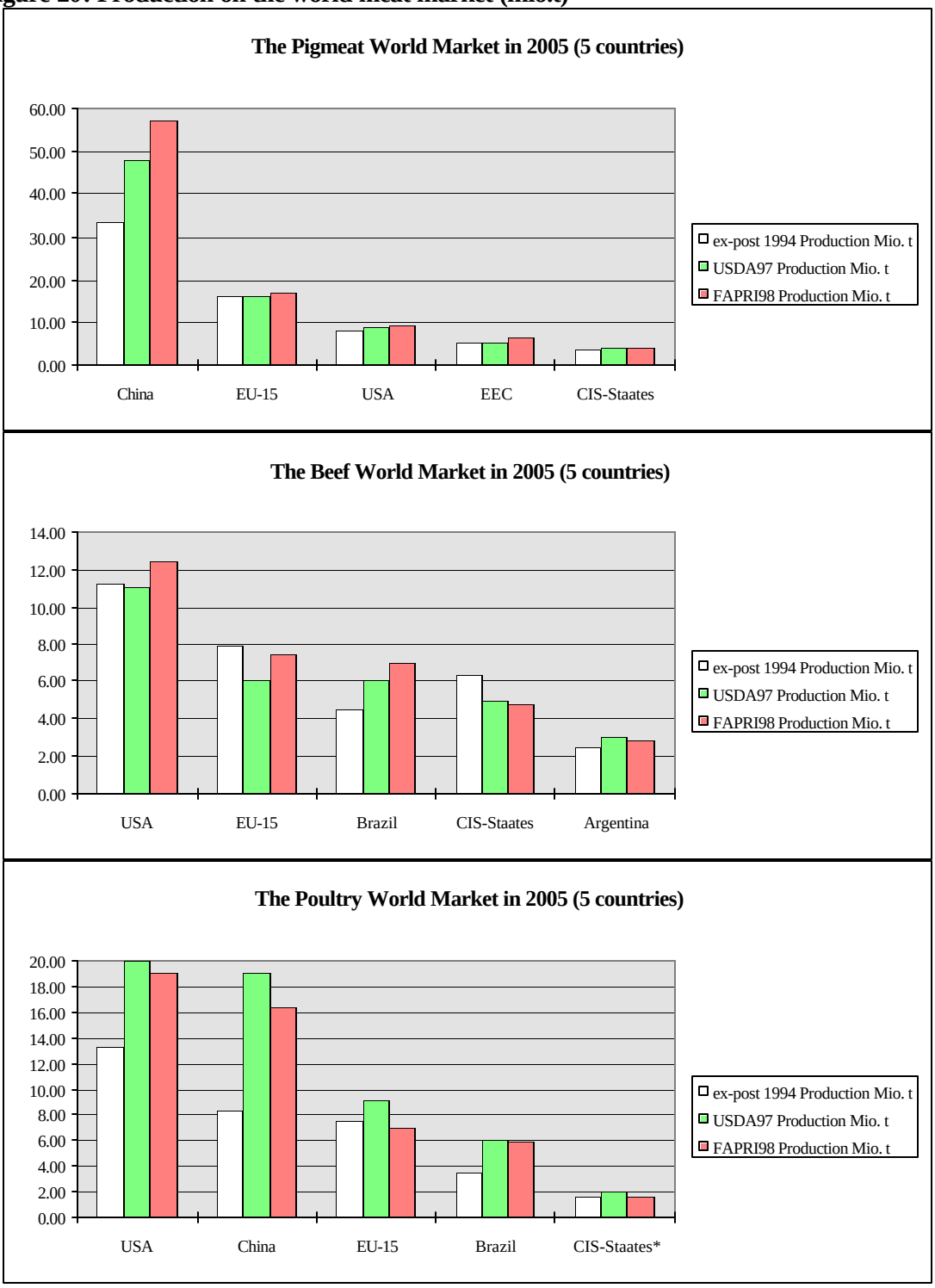


Figure 21: Consumption on the world meat market (mio.t)

Figure 22: Net-Trade on the world meat market (mio.t)

Figure 23: Production share of the five biggest producer of the world meat market (%)

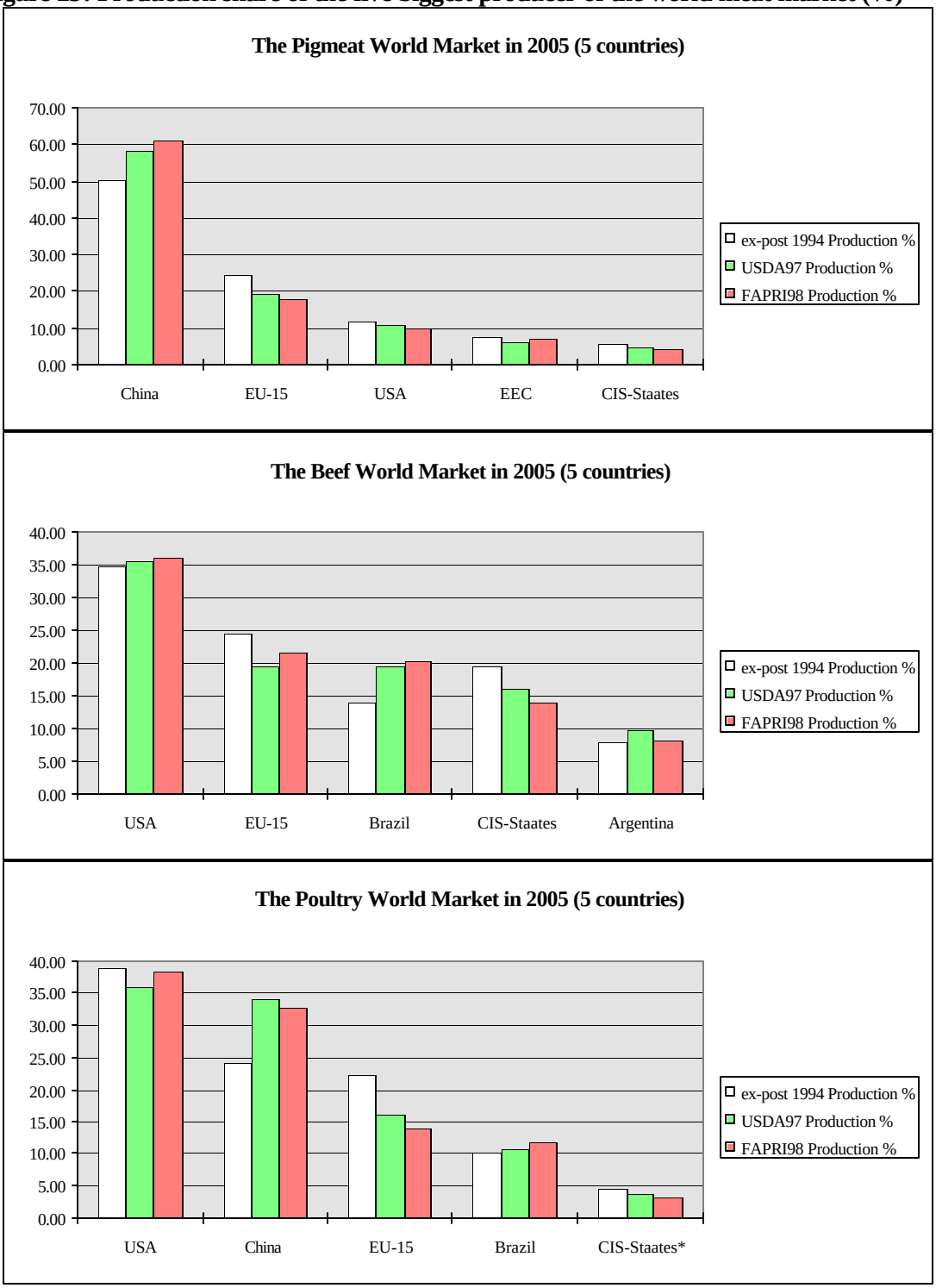


Figure 24: Consumption share of the five biggest consumer on the world meat market (%)

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