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RECENT AGRICULTURAL POLICY DEVELOPMENTS AND OPTIONS IN BULGARIA

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ABSTRACT

The paper presents a brief picture of the country's reform process and the main developments of its agricultural sector. Then it develops a multi-market, dynamic, partial equilibrium and synthetic type model for exploring price and trade policy measures in Bulgaria. The model is used for undertaking price and trade policy analysis for the period up to 2002 with 1997 as a base year examining scenarios such as full price liberalization and adoption of CAP-type policies.

KEYWORDS:

AGRICULTURAL POLICY, PRICE POLICY, TRADE POLICY, SIMULATION, BULGARIA

1. INTRODUCTION

The transition from a centrally planned to a market economy is a complex process that raises many issues. Such issues include not only the change in farm structures, privatization of land and restructuring of upstream and downstream industries, but also and most importantly, the establishment of an incentive framework and the development of markets, along with institutional changes and reforms. The choice of the incentive framework is central in the process of transition because of its short-term effects on production, but also its long-term impact on the evolution of an efficient farm structure, as well as on investment and productivity. It is a well-established notion that the long term impact of price distortions is far more important than its long-term effects.

Bulgarian agriculture is at a crucial stage of transformation. The land reform is advanced and nearly 65% of agricultural land is returned to previous owners. Further steps for price and trade liberalisation were undertaken. Since July 1997, the system of controlling the price level of basic foodstuffs, known as "monitored price system," has been abolished. The ban for grain exportation was lifted and replaced with an export tax. The government has mostly liberalised the foreign trade regime of the agricultural products. Unfortunately all these measures of agricultural policy are not sufficient for assuring a successful development of Bulgarian agriculture.

The main challenges of Bulgarian agriculture and the food-processing industry for the near

future are completing transition, increasing competitiveness along the agro-food chain, and elaborating concrete steps for policy convergence with EU agricultural policy. Elaborating an appropriate incentive system (measures of price and trade policy) has important policy consequences for Bulgarian agriculture and this is feasible only by undertaking a policy analysis exercise of alternative options.

The purpose of this paper is twofold; (a) to review recent agricultural policy developments in Bulgaria, and (b) to develop a multi-market, dynamic, partial equilibrium, synthetic type model for exploring price and trade policy measures in Bulgaria. The main features and characteristics of such a country policy-analysis model are presented in detail in Mergos et al. (1999). The present model has, however, some additional features: (i) it introduces a land constraint, (ii) it uses a price transmission mechanism to account for quality differences and for limited transmission between world and domestic prices, and (iii) it uses complete demand and supply elasticity matrices.

First, the paper presents a brief picture of the country's reform process and the main developments of its agricultural sector. Then, it proceeds with the description of a model and shows how it can accommodate price and trade policy analysis for an economy in transition as well as the data requirements for the implementation. Then, it continues with the use of the model and the results of the policy simulations and concludes with some remarks about the policy options available for the country's agricultural price and trade policy.

2. AN OVERVIEW OF THE BULGARIAN ECONOMY AND RESTRUCTURING

2.1 Macroeconomic Developments

At the beginning of the period of transition Bulgaria had a negative economic growth which accounted for 27% of GDP for the period 1990-1993. In 1994, a small increase in GDP was observed and it was the first post-reform year when a positive growth was registered. The positive growth continued in 1995 but in 1996 it reversed again to negative (a drop of 10.9% is registered). The total decrease in GDP for the period 1990-1997 is 32,02%.

Due to the delay in privatisation and to relatively soft budget constraints the internal debt increased from US\$10.6 billion at the end of 1990 to US\$12.5 billion in 1993, representing 115% of GDP. During the period 1992-1993 the government negotiated a series of partial deals that rescheduled the share of external debt owed to foreign governments under the condition that Bulgaria would resume interest payments on this debt. A large debt restructuring deal was worked out with the London club of commercial banks, covering a debt of approximately US\$8.7 billion in June 1994. As a result of the London club deal, gross foreign debt fell to US\$10.4 billion by the end of 1994, with a further decrease in 1995, to US\$9.45 billion. The debt service has put substantial pressure on the state budget. Budget deficit increased to 11% in 1996 (OECD, 1997).

During the period of transition, inflation was high although there were short periods in which the inflation was reduced to under 3% (from 09 in 1991 to 04 in 1992, from 06 in 1993 to 02 in 1994, from 01 in 1995 to 03 in 1996) monthly. Difficult initial conditions and problems in structural reform (escalating domestic debt, accumulation of financial losses in the banking sector, difficulties in imposing controls on capital flows and foreign exchange transactions) contributed to a fundamental instability in the demand for money. As a result of accumulated debts in 1996 many of the commercial banks ran out of liquidity and some of them entered in a procedure of bankruptcy. At the end of 1996, the financial system was practically blocked.

Although the privatisation law was voted in 1992 the process of "cash" privatisation was delayed. The list of enterprises for privatisation has been changed several times. The procedure for privatisation was difficult and highly bureaucratic. Up to the end of 1996, the number of privatised state and municipal enterprises or part of them was 2396. The biggest part of the privatised enterprises is in the field of services (shops, cafes, restaurants, auto-services and storage). The mass privatisation started at the end of 1996 and the first session took place in October the same year.

During the period of transition the real income has fallen dramatically. In 1996 the real income consisted of 34.4% of the real income in 1990. The importance of the income from the so-called households' plots increased during the same period. The share of this source of income in 1990 was 14.1% and increased to 27.6% in 1995 and recovered slightly to 22.6% in 1996. As a result of this decrease in real income the share of food expenditures per capita increased (from 36.3% in 1990 to 48.2% in 1996) although the consumed quantity per capita decreased. For a significant part of the population (low-income groups) the share of food expenditures is substantially higher and the consumed quantity is dramatically low.

The Bulgarian economy met a second shock at the end of 1996 and at the beginning of 1997. The index of inflation reached 491.9%, for the first two months only, the Bulgarian leva was devaluated more than 6 times (from 487.35 leva per USD in December 1996 up to 3000 leva per USD in mid February), the crisis in the financial system sharpened, hard currency reserves of the Bulgarian National Bank (BNB) declined by 20% (from mill USD 518,4 in December 1996 to mill USD 415 at the end of January, 1997). The main reasons for the second shock were the lack of confidence in the government, the accumulated potential inflation and the attempt of the BNB to create conditions for selling the state debt at lowest budget costs.

After the political changes the first sights of stabilization appeared. Inflation in March, 1997 dropped to 12.3 %, the annual monthly exchange rate declined to 1660.07 leva per USD, the currency reserves at the end of the month increased by mill USD 139.3 (compared to January of the same year) and reached mill. USD 554.3 (the December, 1996 level). The process of stabilization continued after signing the agreement with the IMF and the received emergency loans from the IMF and the World Bank as well as the financial aid from the European Union. Under the contract with the IMF, Bulgaria took some actions the main ones being: to speed up the privatization process and land restitution, to start structural reform in the bank system and overall economy, to liberalize the trade and price regime.

The currency board was introduced in July 1997. In the last few months before the currency board introduction the significant devaluation of the Bulgarian leva from the beginning of the year came to a halt, the inflation was reduced, the main banking interest rate decreased, and some steps towards increasing income, were taken. The national currency was connected to the DEM at rate 1DEM=1000BGL. Under the recommendation of the IMF the interest rate was decreased further. Strong restrictions on the banking sector were imposed and strong measures speeding up the process of privatisation and restructuring of the economy were taken. Price controls of agricultural and food products were removed and some steps towards the trade liberalisation (removing bans on export) took place.

After the second shock at the end of 1996 and beginning of 1997, and the emergency measures taken in the mid 1997, the recovery of the Bulgarian economy was observed. That is to say there was a growth of the economy in 1998, repressed inflation to the lowest level during the whole transition period, stabilization of the bank and financial system, substantial reduction of the budget deficit, reduction in the internal debt of the government and speeding up of the process of privatization. The relative stabilization of the financial and bank system in the country contributed to the positive growth of the economy. The bank

liquidity increased which allowed for some decrease in the main bank interest rate. But the strong control and particularly the high requirements on credit policy imposed as well as the fear of increasing the share of non-serviced credits, still had the negative impact on the dynamics of the internal credits (the total amount of credits declined by 16%). In 1998 the positive tendency of improving the structure of the bank claims in favour of the non-government sector and particularly to the private sector was kept.

The internal convertibility of the national currency imposed in mid 1997 with respect to the requirements of the currency board introduction also contributed to the macroeconomic stabilisation. The relatively stable exchange rate and low main interest rate (kept at the level of 5-6% during the year, the lowest one during the transition) led to an increase in expenditure for investment in the public sector of the economy. But although substantial this growth could not offset the reduction in capital investment during the transition years.

For the first time during the transition period inflation dropped sharply, and consequently deflation (on the monthly basis) was observed in some months. The annual inflation was insignificant (1.0% from December 1997 to December 1998) which positively reflected the real income of the population.

2.2 Agricultural Development

Agriculture in Bulgaria has always been an important sector of the economy. The country had a high degree of self-sufficiency and a positive trade balance. In addition, in the pre-reform period the country specialised in the production of agricultural and food products under the government agreements among the ex-CMEA-countries. As a result, the share of agricultural exports was substantial with the ex-socialist countries as the main importers. During the transition period (1989-1996) a substantial drop in gross agricultural output has occurred but due to the decline in production of the economy as a whole, the share of agriculture and food industry in GDP, after the initial decline at the beginning of the period, remained approximately the same. The agricultural share of gross value added during this period was between 14.4% in 1991 and 14.6% in 1996 as in 1997 reached 25.9%.

In spite of the decrease in agricultural output the share of agricultural exports in total exports increased from 15% in 1990, to 26% in 1992 and to 19% in 1996 (strong restrictions on exports during the whole period have to be considered) as the drop in the share of export continued in 1997 and reached 14% (the lowest level during the transition period). It should also be mentioned that imports of agricultural and processed products increased during this period (from 4% in 1990 to nearly 8% in 1995). Agricultural trade balance remained highly positive and the level of self-sufficiency for the majority of agricultural products is still high.

Total cultivated land in Bulgaria is 4.6 million HA of which at the beginning of the transition period 3.8 million HA arable land, 0.3 million HA meadow, 0.2 million HA lawn and 0.3 million HA permanent crops. At the end of this period, the arable land increased to 4.2 million HA but the lawn and land under permanent crops decreased respectively to 0.01 and 0.2 million HA. The sharp drop in lawn occurred in 1992 (by more than 80%) while the decrease in land under permanent crops occurred during the whole period. There was a tendency towards increasing the non-cultivated (abundant) areas and in 1996 their share was 27.6% of the cultivated land. During the period 1989-1996 some changes in the arable land structure were observed. There were no substantial changes in the share of land under grains (in total arable land) during the period 1989-1995 while in 1996 a substantial drop by more than 10% (compared to 1995) and by 16% (compared to 1989) was registered. Some small increase in area under industrial crops (by 4-5% at the end the end of the period) was observed. The land under vegetables decreased by 2%. The decrease for permanent crops

was more substantial (from 3% in 1989 to less than 1% in 1996).

Private share in agricultural production grew and became prevailing. Whilst for some products, like fruits, vegetables, meat and to a certain degree milk and animal products, the private sector was substantial even in the pre-transition period where most of the other products were concerned, its share used to be insignificant. At the beginning of the transition period 15.5% of the cultivated land was used privately. The most important was the share of private land under vegetables (51.3%) and meadow and under permanent crops, 36.8% and 28.4% respectively. The share of the private sector during the transition has increased constantly and at the end of the period 95% of the arable land was cultivated privately.

In the pre-reform period all prices at all levels were centrally fixed for all channels of distribution. To maintain consumer prices of food goods at low levels, in general, prices of agricultural output were set at a low level, sometimes below production costs. To compensate farmers' losses, a substantial amount of the budget was used for different support programmes: price subsidies, output bonuses, deficiency payments, input subsidies, export subsidies. During the first years of transition some of the previously used support programmes were removed, others were substantially cut down. The budgetary expenditures for agriculture declined by more than 97% (at 1990 prices) during the period 1990-1996. Some of the main reasons for this decline were the strong budgetary constraints and the large budget deficit. This decline also shows that, in practice, there has been no government support to farmers in the last years of the period.

2.3 Brief description of applied Agricultural Policy

Agricultural price and trade liberalisation took place as a part of general macroeconomic liberalisation in February 1991. Fixed prices of agricultural and food products were removed although control on basic foods was introduced. The price policy instruments used after price liberalisations were: a minimum price system, a system of projected prices, a system of ceiling prices. The system of minimum prices included mainly grains, wheat flour for procurement, meat (veal, pork, weaned lamb) and milk. The established (by decrees) minimum prices were the prices below which dealing was prohibited, but not prices, which signalled market intervention. They were fixed at levels below world market level and since market intervention was not foreseen they did not have a real effect. Another reason due to which the minimum prices did not work was that they were fixed at current (nominal) prices and because inflation was high during the period 1990-1996. These prices were at the level substantially below the level they were set up at.

The system of projected prices comprises the retail prices of some staple foods (bread, pork, veal, milk and yoghurt, cheeses (white and yellow) and some other products for short periods and the intermediate prices of flour, intended for bread. The system of projected prices was aimed at keeping low food retail prices. It was based on the production cost and normative profit margin at each level of the chain. Projected prices were announced regularly. Agents in the food chain could justify the increase above the projected prices by proving increased costs.

The system of projected prices was replaced by the system of ceiling prices in 1993. The common element of the two systems was that both were aiming to control the prices of goods and services of special importance for the living standards of the population and the economy of the country. Apart from influencing the price levels, the systems of projected and ceiling prices were aimed at controlling the monopoly in processing as well as the trade with agricultural-commodities, especially in the first year of the analysed period.

The main goal of the foreign trade regime during the period of transition was to provide the domestic market with the major food goods at lower prices in favour of consumers. All possible restrictions in the trade regime were used in order to achieve this goal: license regime; quotas; export and import taxes; variable levies; specific duties; bans on export; minimum export prices. The trade regime was frequently changed. The presumption for these strong restrictions in the trade regime is that producers of raw materials would be forced to offer their output on the domestic market and to the processing companies and, as a consequence, prices would be lower. Irrespective of the low dependency of supply on prices of farm products, producers, when deprived of the possibility to receive satisfactory income from sales at the domestic market, tend to react by limiting or even stopping their activities. Such trends have already been observed over recent years. This trend has already been observed in grain, meat and milk production

Limiting farmers' opportunities to obtain higher income from selling their output on the external market shall hardly be set off by the schemes for direct payments to producers. Such schemes do not only encumber the budget, but lead to excesses in bureaucratic procedures. Thus their overall effect is controversial. Existing practice depicts the fact that Bulgaria is a minor participant in international trade and cannot affect the major commercial flows. This is why the attempts to form an export structure with a predominance of highly processed commodities through a foreign trade regime alone are ineffective. For example, the efforts to export flour instead of wheat proved unsuccessful because of the logical responsive policies of restricting the imports on our basic markets (Simova, 1995).

During the period of transition, Bulgaria changed its customs tariff twice, (Davidova, Ivanova, 1996). The changes have been consistent with the general policy of harmonisation with the EU. The new tariff also makes a stem towards a partial application of the combined nomenclature of the EU. The establishment of clear, secure and tradable property rights is a precondition for successful transformation to a market economy. In agriculture and in the agro-food chain, this involves: (i) restitution of land ownership rights; (ii) liquidation of collective farms (old production co-operatives) and distribution of their assets; (iii) privatisation of input supply, food processing and distribution industries. The process of restitution of land ownership rights was virtually launched in February 1991 when the Law for Agricultural Land Ownership and Land Use (LALOLU) was adopted by Parliament and applied.

The "Law for the Protection of Agricultural Producers", voted in June 1995 was more or less an attempt to design a system for regulating agricultural production and market. The Law was aimed at: a. establishment and maintenance of favorable economic conditions for sustainable development of competitive agriculture and b. securing of national food balances by regulating production and trade of processed and raw agricultural products. The Law included mechanisms of market price support and financial support. Market price support included: guaranteed floor prices for 9 major agricultural products (wheat, maize, sugar beet, potatoes, beef, lamb, pork and cow and sheep milk) and projected prices for other products determined on the basis of annual program for agricultural developments. Guaranteed prices are based on the average production cost of individual commodities plus a profit margin. They cannot exceed 85% of the national currency (leva) equivalent to the average export prices over the last 3 years.

Both systems have been used before, but not accompanied by intervention on the market. According to the Law, fund "Agriculture" (established by the Law) should intervene in the market if current market prices are below 95% of the established guaranteed floor prices or if current prices are more than 20% higher than the guaranteed prices. The obligation of the fund for buying the quantities supplied required a large amount of money to be available for

these purposes. Due to the shortage of money in the fund the mechanism of guaranteed price was practically not used and it was removed with the amendments in the law (new Law voted) in 1998.

Another attempt to control domestic prices was made with the Price Law voted in 1995 and the Regulations for Applying the Price Law. According to the Price Law, minimum prices for wheat were introduced and continued to exist till this day. Furthermore, projected retail prices for the main food and non-food products were also introduced and reinforced. The list of the goods with projected prices is the same as the list of products included in ceiling price system in 1994. The mechanism of determining the prices is production costs plus profit margins. There are no foreseen mechanisms for intervention in the market, except for the changes in the trade regime. In the case where the domestic market of the Price Commission is unbalanced, it has the right to freeze the prices.

In mid 1997, the projected price system was replaced by system of contracted prices and the range of the products included was reduced. In 1998 the last system was removed and prices were practically fully liberalized. Land restitution process was particularly delayed during the last year of the reform. Total land returned to former owners at the end of October 1997 accounted for 65.9% of the total land claimed. All expectations for a rapid completion of Bulgarian land reform have proved ill founded. The legislation concerning these problems and especially LALOLU has meanwhile undergone numerous amendments, and some of the amendments were rather contradictory. The restitution of the land in the existing boundaries, which does not require substantial financing, is slow. On October 27th 1997 land was resituated on 2377 (from 4833) settlement territories, which accounts for 49.2% of all ownership right subject to restitution. However a bare 8% of the owners have obtained title deeds. The delay in land restitution is one of the reasons for the deterioration of agriculture during the transition.

3. THE APAS MODEL AND ITS EMPIRICAL IMPLEMENTATION

APAS (Agricultural Policy Analysis Simulator) is a country-level, partial equilibrium, dynamic, multi-market, synthetic, policy oriented, spreadsheet based, simulation model. The advantage of a multi-market model in analyzing agricultural price and trade policies is that it can accommodate a large number of products (livestock, food crop, industrial crop and tree crop products) that represent the largest part of Bulgaria's total agricultural production. The advantages and disadvantages of partial vs. general equilibrium in trade policy reform is also well known (Hertel, 1993).

Such static simulation models have been used in the past for simulating agricultural price changes in economies in transition but also in some market economies (see, Thomson, 1991 and Roningan et al. 1991, Stoforos *et al.*, 1997 for some applications of multi-market models in market economies). A detailed description of a similar, but simpler model for the agricultural sector of a transition economy is given in Mergos *et al.* (1999) and Stoforos *et al.* (1999). The main drawback of such models is in the way the matrix of supply elasticity is constructed. In the present case, however, consistency with theory is ensured (see below), thus the theoretical underpinning of the model is sound.

The model implicitly introduces a mechanism for the determination of agricultural prices under transition. The price for each agricultural product is an administered price or a cost based price or a market clearing equilibrium price to which some taxes and/or subsidies are added. The core of the model consists of a set of elasticity matrices, a matrix of demand elasticity and a matrix of supply elasticity, and usual behavioural assumptions. Production depends on area harvested (for the crop sector) or total number of animals (for the animal

products) and average yield response.

The elasticity matrices were constructed using previous individual commodity elasticity estimates for Bulgarian agriculture (Ivanova et al., 1997, Tzoneva et al., 1997). Missing elasticities were calculated using the theoretical restrictions as proposed by Pyles (1989), thus maintaining the theoretical consistency of the model and the assumption of strong separability at the main product category level. Four main product categories are distinguished: 1. *agroindustrial crops*: tobacco (TOB), sunflower (SNF), sugar beet (SGB), 2. *food crops*: wheat (WHE), rice (RIC), potatoes (POT), tomatoes (TOM), maize (MAI), barley (BAR) and peppers (PEP), 3. *trees*: grapes (GRP), apples (APL) and 4. *livestock products*: cattle meat (CMT), pig meat (PMT), poultry meat (LMT), cow milk (CML).

In this form of the model there are 4 equations for each product: (i) land used; (ii) yield (yield is not responsive to changes in prices and it is assumed to be technology driven); (iii) total supply (identity land*yield) and (iv) demand. The disequilibrium between domestic supply and demand is cleared by net trade. A price transmission mechanism was introduced to link domestic to border prices and account for quality differences and imperfect transmission. A land constraint was introduced with area equations that are solved simultaneously under the restriction of total land availability. Area elasticities of supply range between 0.26 to 0.75. Elasticities of supply with respect to input prices range between -0.07 and -0.40. Own-price demand elasticities range between -0.10 to -0.60. Income elasticities range between 0.12 to 0.9.

4. SIMULATING POLICY REFORM

The simulation covers the five-year period up to 2002 with 1997 as the base year. The main assumptions cover the developments of nominal domestic and border prices, the exchange rate, GDP growth rate, and inflation. The central assumption is that macro-economic and monetary stability will be maintained.

Table 1. Production, Consumption and Trade for the Main Agricultural Products-Base Scenario

	(000 tonnes)													
	1997			1999			Change 97/99		2002			Change 02/97		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(1)	(2)	(3)	(1)	(2)	
Grapes	695	543	152	675	532	143	3%	-2%	674	528	146	2%	-3%	
Apples	208	245	-36	202	241	-39	1%	-2%	202	254	-52	1%	4%	
Wheat	3774	3532	241	3884	3575	309	3%	1%	3887	3634	253	3%	3%	
Maize	1502	1636	134	1557	1589	-31	4%	-3%	1557	1591	-34	4%	-3%	
Potatoes	463	514	50	473	509	36	5%	-1%	474	515	41	5%	1%	
Barley	998	1078	-80	1059	1116	-58	6%	4%	1060	1121	-61	6%	4%	
Tobacco	41	39	2	42	41	2	3%	4%	43	43	0	5%	11%	
Sunflr.	480	420	60	496	466	30	3%	11%	491	474	17	2%	13%	
Beef	78	83	-5	81	89	-9	4%	7%	81	95	-14	4%	13%	
Pig Meat	200	159	40	211	166	45	6%	4%	213	175	38	7%	10%	
Poultry	92	83	8	98	82	16	7%	-2%	100	95	5	8%	13%	
Milk	1387	1390	-3	1470	1489	-19	6%	7%	1471	1549	-78	6%	11%	

Note: Column (1) is Production, (2) Consumption and (3) Trade.

The results of the baseline scenario show a small increase in agricultural production for all products (Table 1), and a slight decline in consumption for grapes and maize, while for all other products demand will increase, mainly due to the increase of income. Income is also increasing.

Trade policy and the rate of protection for agricultural products

The first step in simulating policy reform is the estimation of the level of protection with the calculation of the PSEs (see Ivanova et al. 1995), although there are limitations of using PSEs in transition economies (see Harley, 1996). In calculating the percentage change of prices received by producers, factors other than those captured by PSE are assumed constant. Table 2 presents the calculated PSEs, which, for the period 1994-1996 are negative implying an implicit taxation of agriculture. The situation, however, seems to change in 1997.

Table 2. Producer Subsidy Equivalent (%)

	1994	1995	1996	1997
Wheat	-50.8	-64.9	-6.1	31.5
Maize	-9.5	-23.4	-17.3	-28.3
Potatoes	53.0	-23.2	9.5	32.4
Barley	-10.0	-52.1	33.6	39.8
Tobacco	-180.5	-137.7	-64.7	-41.8
Sunflower	-34.6	-37.9	-12.1	-64.3
Beef	-12.4	-7.9	-62.6	-41.5
Pig Meat	-10.9	-1.3	-3.1	35.1
Poultry	-58.1	-10.1	-102.5	-65.6
Milk	-52.3	-36.6	-100.1	-99.9

Simulating the Impact of Trade Policy Reform

a. Scenario FL: Abolition of all protectionism measures. Equalisation of domestic to international prices.

The scenario examined in this simulation assumes that all protection rates (either positive or negative) will be removed resulting in an equalisation of domestic to international prices. Such a policy would imply important modifications in the agricultural price structure. The results of the simulation are presented in Table 3 for the impact on production, consumption, revenue and trade. The price increase will have positive effects on the supply of most of the products except for those, which had a positive PSE in 1997 (wheat, barley, potatoes and pig meat). The increase in production ranges from 5.6% for sunflower to 21.3% for maize; whereas the wheat production will decrease by 17.4% (over the period 1997-2002).

Table 3. Impact on Production, Consumption, Revenue and Trade

	99/97	99/97	99/97	99/97	02/97	02/97	02/97	02/97
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Grapes	4,1	1,0	32,9	105	6,9	-6,6	118	164
Apples	5,0	-2,6	69,9	-28	7,0	1,8	160	-35
Wheat	-1,5	2,5	-9,4	95	-13,1	8,0	-26	-535
Maize	1,7	-2,8	-4,2	-63	8,0	-0,8	27	-2
Potatoes	-1,5	2,7	-8,5	148	-16,5	4,0	-29	77
Barley	5,7	8,0	-6,5	-110	-0,3	8,3	-25	-172
Tobacco	8,9	3,7	37,8	4	17,8	-4,6	109	11
Sun flr.	0,3	0,9	37,3	58	5,6	-8,4	117	122
Beef	-2,9	7,4	22,7	-14	7,1	-3,8	90	3
Pig Meat	10,6	8,9	0,8	48	2,9	13,2	-17	25
Poultry	-1,1	-11,1	36,4	16	10,4	0,3	129	17
Milk	11,5	3,3	63,9	110	14,8	-13,3	187	386

Note: Column (1) is Production (%), (2) Consumption (%), (3) Revenue (%) and (4) Trade in quantities (000 tonnes).

While the impact on production will be positive (for the majority of the products under

consideration), the increase in prices will have negative impact on demand for the agricultural products but due to increases in the total effect will be positive for a number of products. Following the price movements the most important increase will concern pig meat while wheat demand will increase by 8% till 2002. Revenue, will increase substantially (for the products with negative PSE's) due to the upward shift in price and production.

The increase in production and the increase in demand (for certain products) will have a positive and negative impact on foreign-trade. Excess supply will be a motive for increased exports and this will be a benefit for the current account balance taken separately for each product (except for wheat, barley, potatoes and pig meat).

b. Scenario FW: Abolition of all protectionism measures, equalisation of domestic to international prices and increase of income by 10% each year.

In this policy simulation, exercised together with keeping all the above assumptions, an additional hypothesis is made about the evolution of income. It was assumed above that income would increase by 5% during the period covered by the simulation. In the present policy simulation, the assumption is that income will increase by 10% per annum.

According to the results, agricultural production will follow the same pattern as in the previous scenario. On the demand side, such a development will increase the demand for all products (the highest increase is that of pig meat, 22,6%). The increase in demand and the change in production will reduce self-sufficiency.

Table 4. Impact on Production, Consumption, Revenue and Trade

	99/97	99/97	99/97	99/97	02/97	02/97	02/97	02/97
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Grapes	4,1	4,6	43,8	85	6,9	0,5	166	126
Apples	5,0	17,1	83,8	-76	7,0	8,1	216	-50
Wheat	-1,5	3,9	-9,4	47	-13,1	14,2	-26	-755
Maize	1,7	-2,2	-4,2	-73	8,0	1,3	27	-35
Potatoes	-1,5	14,3	-8,5	115	-16,5	9,7	-29	61
Barley	5,7	9,6	-6,5	-127	-0,3	14,5	-25	-239
Tobacco	8,9	9,5	37,8	2	17,8	14,3	109	4
Sun flr.	0,3	4,3	37,3	44	5,6	0,7	117	90
Beef	-2,9	17,1	22,7	-22	7,1	20,2	90	-17
Pig Meat	10,6	3,9	0,8	56	2,9	22,6	-17	10
Poultry	-1,1	-12,9	36,4	18	10,4	16,0	129	4
Milk	11,5	18,4	63,9	-100	14,8	9,5	187	68

Note: Column (1) is Production (%), (2) Consumption (%) (3) Revenue (%) and (4) Trade in quantities (000 tonnes).

c. Scenario E1: Equalisation of domestic to EU prices.

While the CAP is of critical importance for Bulgaria, the EU also considers that any prospective enlargement has significant consequences for the CAP. Given the importance of agriculture in the CECs, accession will have a major impact on EU agricultural markets and agricultural policy. The scenario examined in this simulation assumes that Bulgaria becomes a member state in the EU and thus, resulting in an equalisation of domestic to EU prices. Such a policy would imply important modifications in the agricultural price structure. It is important to state that in this scenario the price reductions that will occur due to the new reform of the Common Agricultural Policy (AGENDA 2000) are considered for the period 2000-02.

The results on production, demand and trade will be similar to the ones observed in the first simulation where a price liberalisation policy was adopted. However, the fact that EU prices

are higher than the world prices will have a more significant effect in both production and consumption and consequently in trade and in farmers revenue.

The impact on production is positive in almost all products (except potatoes). The increase varies from 3% for apples to 23% for tobacco (livestock products will benefit more from the EU economic environment).

Table 5. Impact on Production, Consumption, Revenue and Trade

	99/97	99/97	99/97	99/97	02/97	02/97	02/97	02/97
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Grapes	2,8	-7,4	41,9	142	8,7	-11,2	170	200
Apples	4,9	-6,3	83,6	-20	3,3	-6,8	205	-21
Wheat	3,0	-6,1	63,6	570	7,9	-8,3	93	835
Maize	12,0	0,2	21,2	43	8,6	-1,1	32	12
Potatoes	-12,0	4,8	-4,8	95	-10,7	6,3	9	96
Barley	4,3	5,2	12,9	-93	6,8	8,5	30	-104
Tobacco	9,5	-10,8	18,4	10	23,5	-3,1	50	13
Sun flr.	14,1	-19,4	23,4	209	10,9	-13,2	26	168
Beef	4,4	-6,4	13,0	3	7,8	-15,2	31	13
Pig Meat	-17,9	-14,7	-11,2	28	5,3	3,8	28	45
Poultry	11,3	-8,8	20,4	26	12,9	-6,0	37	25
Milk	1,1	-2,3	9,4	43	16,3	-7,0	41	319

Note: Column (1) is Production (%), (2) Consumption (%), (3) Revenue (%) and (4) Trade in quantities (000 tonnes).

Demand will decrease for the majority of the products under consideration with the most noticeable shift being that of beef. Farmers' revenue will increase substantially due to price and output increases.

d. Scenario E2: Equalisation of domestic to EU prices along with the incorporation of policy instruments.

The EU Commission has prepared estimates of the budget costs of accession to the FEOGA Guarantee fund based on the scenarios developed in its Strategy Paper. The principal assumption behind these scenarios was that the 1995 CAP would apply to the interested countries, including arable aid payments and livestock premia. On the working assumption that all ten associated countries would join the Union in 2000, it estimates that the budgetary impact of enlargement would be an additional cost of the order of ECU 12 billion per year after the period of transition and adjustment. The arable aid and animal premia would represent about half the total cost.

In this policy simulation exercise together with keeping all the above assumptions (EU prices), an additional hypothesis is made about the policy instruments of the CAP. It was assumed above that Bulgaria enters the EU and adopts the price system of the CAP without the incorporation of the various policy instruments (compensation payments, quotas, etc.). In this scenario the policies followed by CAP to protect agriculture are incorporated. Sixty percent (60%) of compensation payments are partly considered as a price incentive for producers and one hundred percent (100%) of animal premia are considered as a price incentive. It is important to point out that the increase in the various payments (compensation, per head etc.) which are included in the AGENDA 2000 proposals is taken into consideration for the construction of policy simulations. According to the results, agricultural production will only realize positive effects as shown in Table 6. The production of all products increased as can be seen from the table below and varies from 6% for apples to 26% for tobacco.

Table 6. Impact on Production, Consumption, Revenue and Trade

	99/97	99/97	99/97	99/97	02/97	02/97	02/97	02/97
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Grapes	10,5	-7,4	215,7	142	9,6	-11,2	212	200
Apples	7,0	-6,3	185,6	-20	5,9	-6,8	180	-21
Wheat	10,7	-6,1	141,0	570	16,5	-8,3	154	835
Maize	27,0	0,2	122,8	43	24,8	-1,1	119	12
Potatoes	-6,0	4,8	2,1	95	4,7	6,3	4	96
Barley	11,7	5,2	72,4	-93	16,0	8,5	79	-104
Tobacco	12,1	-10,8	238,2	10	25,3	-3,1	278	13
Sun flr.	9,8	-19,4	170,5	209	9,5	-13,2	170	168
Beef	5,4	-6,4	187,4	3	11,3	-15,2	204	13
Pig Meat	-6,5	-14,7	30,4	28	9,0	3,8	52	45
Poultry	12,7	-8,8	180,0	26	14,3	-6,0	184	25
Milk	-4,3	-2,3	107,2	43	17,9	-7,0	155	319

Note: Column (1) is Production (%), (2) Consumption (%) (3) Revenue (%) and (4) Trade in quantities (000 tonnes).

An important issue for the EU is the cost of the policy under investigation and the transfers from FEOGA to Bulgaria. According to this scenario the accession of Bulgaria to the EU will cost approximately (in terms of FEOGA transfers) 823 million ECU's (Table 7). The basic assumption of this scenario is that Bulgaria became a full EU member state in 1998.

Table 7. Inflows from EU to Bulgaria

	Total Inflows (in ECU)	Total Inflows (in leva)
1998	778.635.595	1.542.259.095.924,86
1999	796.642.880	1.577.926.486.219,77
2000	805.405.885	1.595.283.544.474,72
2001	815.993.802	1.616.255.244.370,99
2002	823.924.691	1.631.964.113.075,22

e. Comparison of all Scenarios for Bulgarian Agriculture.

In this paper, five scenarios (baseline, full liberalization, full liberalization with income increase, EU prices and EU prices with policy) were considered for examining the possible effects on Bulgarian agriculture. In Table 8 the results of all scenarios are presented (supply, demand and trade).

According to the results, Bulgarian agriculture (in terms of supply, trade and consequently revenue) will be in its best position if it enters the EU as a full member and if the CAP is introduced (with all mechanisms). In terms of demand, Bulgarian consumers will be in a better situation, for all products, in the full liberalization scenario with the income increase (10%) scenario. Figure 2 presents total cultivated land under the various scenarios (BL, FL, FW, E1, E2). As it can be seen the E2 scenario presents the most important increase (2767 thousand HA by year 2002) followed by the E1 with an increase of 2606 thousand HA by the year 2002. The scenarios that present a decrease in total cultivated land are FL and FW (2267 and 2277 thousand Ha in 2002 respectively). BL present a small increase, more specifically, 2439 thousand HA (it is important to state that the starting point in 1997 was 2325 thousand HA.)

Table 8. Impact on Supply, Demand, and Trade in all Scenarios (2002/97)

	BL	FL	FW	E1	E2		BL	FL	FW	E1	E2
Grapes						Tobacco					
Supply	2	7	7	9	10	Supply	5	18	18	23	25
Demand	-3	-7	0	-11	-11	Demand	11	-5	14	-3	-3
Trade	146	164	126	200	250	Trade	0	11	4	13	29
Apples						Sun flr.					
Supply	1	7	7	3	6	Supply	2	6	6	11	9
Demand	4	2	8	-7	-7	Demand	13	-8	-1	-13	-13
Trade	-52	-35	-50	-21	-25	Trade	17	122	90	168	158
Wheat						Beef					
Supply	3	-13	-13	8	16	Supply	4	7	7	8	11
Demand	3	8	14	-8	-8	Demand	13	-4	20	-15	-15
Trade	253	-535	-755	835	1335	Trade	-14	3	-17	13	12
Maize						Pig Meat					
Supply	4	8	8	9	25	Supply	7	3	3	5	9
Demand	-3	-1	1	-1	-1	Demand	10	13	23	4	4
Trade	-34	-2	-35	12	240	Trade	38	25	10	45	65
Barley						Poultry					
Supply	6	0	0	7	16	Supply	8	10	10	13	14
Demand	4	8	14	9	9	Demand	13	0	16	-6	-6
Trade	-61	-172	-239	-104	91	Trade	5	17	4	25	32

Notes: a. Supply and Demand are presented in % changes in 2002 over 1997 and trade in quantities (000 tonnes), b. (BL) is the baseline scenario, (FL) the full liberalisation scenario (constant world prices), (FW) the full liberalisation scenario with an increase in income, (E1) the EU scenario (EU prices) without policy and (E2) the EU scenario with the incorporation of CAP.

Figure 1. Total Cultivated Land in all Scenarios (1997-2002)

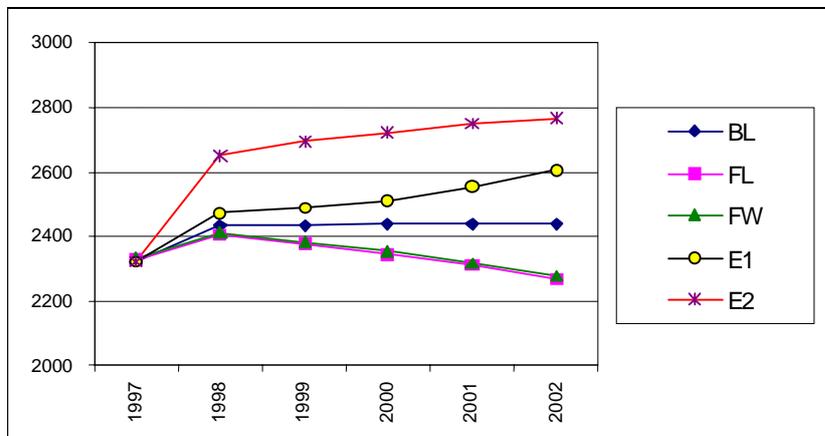


Figure 2. Trade (2002)

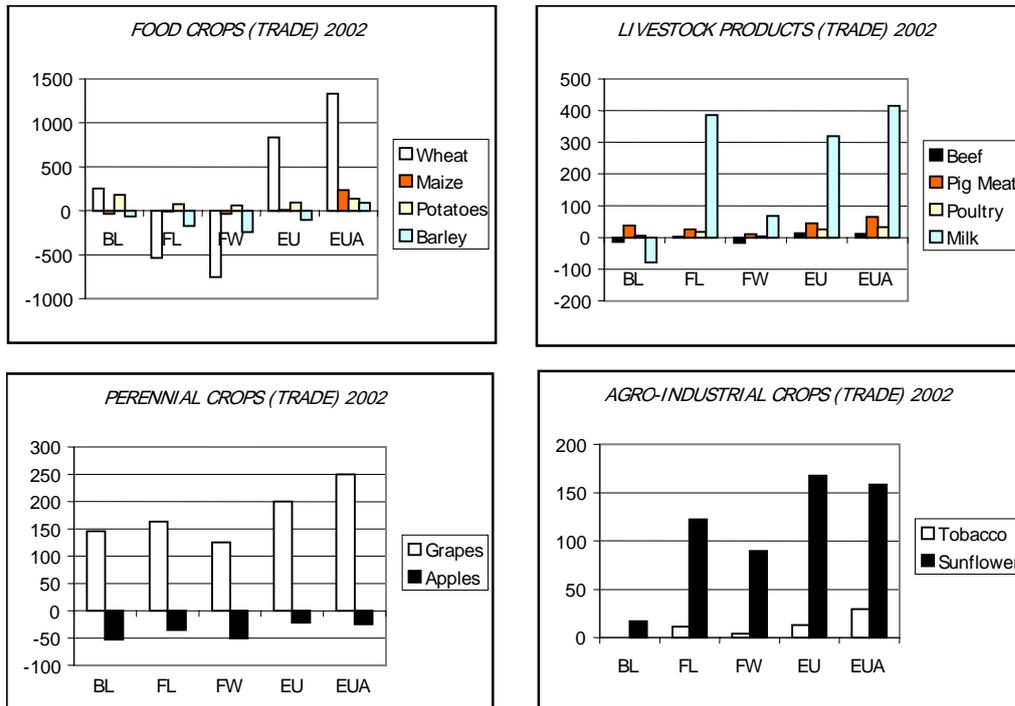
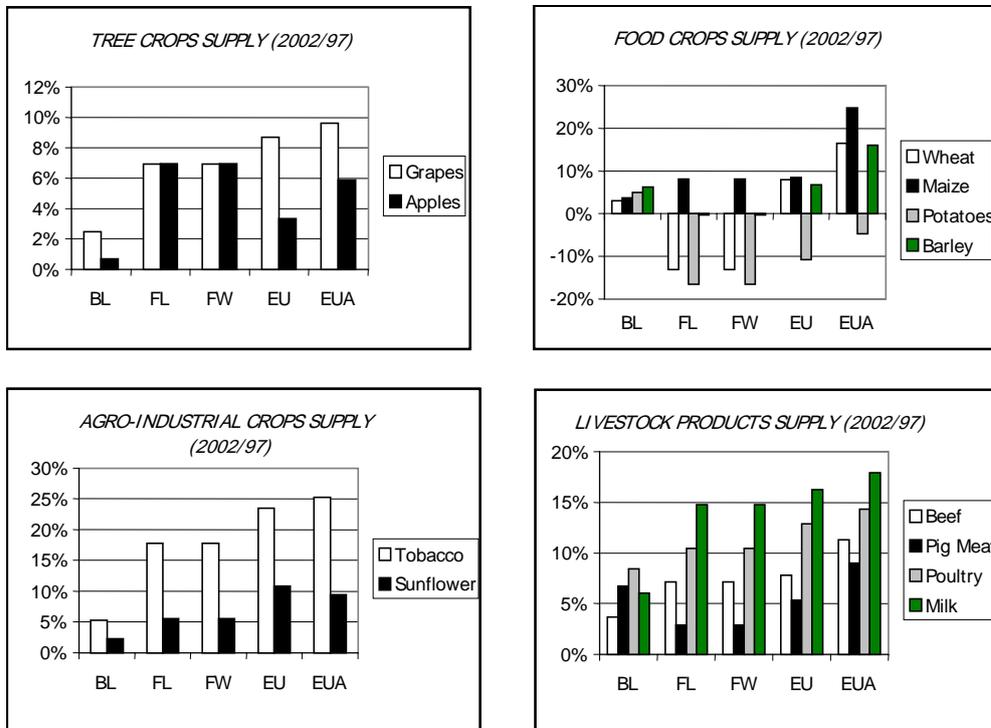


Figure 3. Supply Comparisons (2002/97)



5. CONCLUSIONS

It is widely recognised that agricultural policy decisions in economies under transition need policy analysis with empirical foundations. The tools available, however, for analysing the impact of available policy options are limited. Synthetic, partial equilibrium, multi-market simulation models offer a useful tool, albeit with many limitations, for analysing the impact of agricultural policy options for economies in transition to market. The purpose of this study was to build and use such a model for analysing agricultural price and trade policy options for Bulgaria.

The elasticity matrices used in the model were developed respecting theoretical restrictions. The model was tested and validated, however, for its properties that confirmed its functioning. The model was then used to evaluate the impact of possible liberalisation policies of agricultural trade in the country and the adoption of CAP type policies. Four scenarios were constructed. The first scenario examined the impact of full liberalisation and the equalisation of domestic to border prices for all agricultural commodities. The second scenario introduced, in addition to full liberalisation, a favourable development in income. The third and the fourth scenarios simulated adoption of CAP-type policies with and without compensation payments.

The results show that the impact of price and trade policies on production, consumption and trade is much more modest than usually assumed. Undoubtedly, the results are preliminary and much more work is necessary to improve the functioning and the efficiency of this sector model. However, a policy analyst can derive wealth of information by comparing the results of the various scenarios, in particular in cases where results are not in line with expectations.

The experience with the use of multi-market, partial equilibrium simulation models in this exercise has been positive. The construction of such a model was possible with modest resource cost compared with the capacity of the model for analysis of agricultural policy options. Partial equilibrium, multi-market models have several well-known limitations. Nevertheless, they are a potent tool for policy analysis and if used with caution and discretion they can provide useful policy analysis results to guide policy decisions.

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